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VOL. II

NUMERICAL ANALYSIS OF STIFFENED SHELLS OF REVOLUTION

Volume II of VII

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* A list of all seven volumes, by sub-title, is on the back side of this page

16. Abstract This report contains the information necessary for application of the STARS-2S (Shell Theory Automated for Rotational Structures-2 (Statics)) program. This new version of the STARS programs retains the basic features contained in the STARS programs since 1963, i.e.

1. Arbitrary branching of the shell meridians.
2. Arbitrary boundary conditions.
3. Minimum input requirements to describe a complex, practical shell of revolution structure.
4. Accurate analysis capability using a minimum number of degrees of freedom.

The STARS-2S program contains the following basic updates to STARS-II:

1. Capability for Fourier series summation.
2. Graphical display capability.
3. A discrete ring.
4. Elastic supports.
5. Isogrid reinforcement.
6. Point input geometry option.

The fundamental structural theory for the program is detailed in Volume I of this series, while the Users' Manual for the stability and vibrations programs is Volume III.

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VOLUME I. Theory Manual for STARS-2S, 2B, 2V Digital Computer Programs

VOLUME II. Users' Manual for STARS-2S - Shell Theory Automated for Rotational Structures - 2 (Statics), Digital Computer Program

VOLUME III. Users' Manual for STARS-2B, 2V - Shell Theory Automated for Rotational Structures - 2 (Buckling, Vibrations), Digital Computer Programs

VOLUME IV. Engineer's Program Manual for STARS-2S - Shell Theory Automated for Rotational Structures - 2 (Statics), Digital Computer Program

VOLUME V. Engineer's Program Manual for STARS-2B - Shell Theory Automated for Rotational Structures -2 (Buckling), Digital Computer Program

VOLUME VI. Engineer's Program Manual for STARS-2V - Shell Theory Automated for Rotational Structures -2 (Vibration), Digital Computer Program

VOLUME VII. Satellite Programs for the STARS System

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LIST OF FIGURES

SYMBOLS

Lower Case Latin

a	semi-diameter perpendicular to Z-axis in ellipsoid
b	semi-diameter parallel to Z-axis in ellipsoid
f	distributed loads in local coordinates
h	shell thickness; face sheet thickness
i	index: beginning edge of shell segment; independent joint of kinematic link; subscript "inside"
j	index: ending edge of shell segment; dependent joint of kinematic link
n	index on harmonic
o	subscript "outside"
r	radius
s	index of segment; coordinate in cylinder or cone
t	core thickness in sandwich shell
w	normal deflection, positive inward

Upper Case Latin

C	stiffness eccentricity parameters; offset distance in ogive, ellipse
D	bending stiffness parameters
E	Young's modulus (lb/in^2)
F	lineal force (lb/in)
G	shear modulus (lb/in^2)
K	extensional stiffness parameters
M	bending moment on shell (in-lb/in)
N	membrane stress resultant (lb/in)
$\overline{N}$	assumed membrane stress resultant (lb/in)
Q	transverse shear stress resultant (lb/in)
R	radius; "global" coordinate, positive radially outward.

SYMBOLS (continued)

T temperature; "global" coordinate, tangential

X Cartesian coordinate, $\theta = 0$ at X-axis

Y Cartesian coordinate

Z Cartesian and "global" coordinate, coincides with axis of revolution

Greek

α angle between rotated coordinates

β ratio of semi-diameter parallel to Z-axis in ellipsoid to semi-diameter perpendicular to Z-axis

γ shear strain; non-linear parameter; angle of inclination of kinematic link

ζ normal coordinate, positive inward

θ circumferential angular coordinate (rad)

λ shell parameter

ν Poisson's ratio

σ normal stress (lb/in^2)

τ shear stress (lb/in^2)

ϕ meridional angular coordinate (rad)

ω rotational displacement (rad)

Ω rotational displacement in "global" coordinates (rad)

Δ displacements in fixed or "global" coordinates

Λ segment length parameter

Miscellaneous

eq equivalent

sϕ sin ϕ

cϕ cos ϕ

Other symbols are defined in the text where used.

SECTION 1

PROGRAM CAPABILITY

The use of an accurate shell theory to analyze structural shell problems usually involves complex mathematics and numerical techniques, which are nearly impossible to treat without the aid of automated procedures. On this basis, a digital computer program based upon the Love-Reissner first order shell theory has been developed. This program can analyze orthotropic thin shells of revolution, subjected to unsymmetric distributed loading or concentrated line loads, as well as thermal strains (Reference 1). Furthermore, a shell with arbitrary boundary conditions, under loads which vary arbitrarily with position and under a temperature variation through the thickness, is tractable with this program. The shell can consist of any combination of the following geometric shapes:

1) Ellipsoidal - spherical (offset from the axis of revolution allowed)
2) Ogival - toroidal
3) Modified ellipse shape
4) Conical - circular plate
5) Cylindrical
6) General point input geometry
7) Dummy geometry slot to be filled by the user
8) Discrete ring
9) Elastic support

The shell wall crossection can be a sheet, sandwich, or reinforced sheet or sandwich. The reinforcement can consist of rings and/or stringers, a waffle construction rotated at any angle to the principal coordinates, or an isogrid construction. General stiffness input options are also available. The reinforcement material properties can differ from those of the main shell, and a temperature variation can cause different properties in the two face sheets of a sandwich shell.

The basic approach to the problem (Reference 1) is to cut the structure into several shell regions. These regions need to be singly-connected shells, and can only have line loads applied at their end points. There are no restrictions on geometry, or uniform or thermal loads. The regions are further subdivided into several shell segments, each being free to have its own geometric shape, provided that the shape falls into one of the categories mentioned above.

Stiffness matrices obtained for each segment, are coupled by standard matrix methods to obtain region stiffnesses, which, after being reduced in size, are in turn coupled to form the total shell structure under analysis. Currently, the UNIVAC 1108 computer program is sized to handle a structure composed of up to 24 segments in each of 19 regions arbitrarily connected to each other. There is a limitation on the size of a shell segment, which is a consequence of the demand that boundary disturbances be felt throughout the segment. This limitation is mathematically described in Section 2 (pages 2-31 to 2-33) as a length parameter. This parameter, however, is not reliable near the apex of any shell shape ($\phi = 0$), and the segments needed in this region are actually much smaller than predicted by the parameter. A mathematical singularity occurs at the apex where r_o (the radius of revolution) becomes zero. It is this singularity which prevents the length parameter from being meaningful near the apex. Furthermore, the point ($\phi = 0$) is not an acceptable input point of the program (except for the torus-ogive and offset ellipsoid), although any point outside a circle of infinitesimal radius is satisfactory.

There is a considerable latitude in what can be done within each shell segment. The thickness of any segment can be symmetrically tapered and it can contain up to 14 points of discontinuity, provided that the segment centerline remains continuous and describable by a single shell geometry. A temperature distribution through the thickness can be specified at three points in a homogeneous shell, and 4 points in a shell of rigid core sandwich construction. The distribution is considered to be linear between these points. Thus, it is possible to approximate temperature distributions other than linear distributions. In the event of physically discontinuous shell centerlines, a kinematic link is available for use in the analysis. The link relates displacements across the discontinuity. This link may be used between

regions, and between segments within a region. Discrete offset rings are also available for use within or between regions.

The present program is also capable of a non-linear analysis of axisymmetrically loaded shells. The analysis of this large deformation case is accomplished by use of iteration. Details of the non-linear theory involved are presented in References 1 and 2, and the program utilization of this option is described in detail in Section 2 of this report. In the linear analysis of unsymmetrically loaded shells, the partial differential equations of the shell theory are reduced to ordinary first order differential equations, which are solved with the aid of a Runge-Kutta method of numerical integration. The reduction is accomplished by use of a Fourier series expansion in the circumferential coordinate, θ. Axisymmetric loading is represented by the "zeroth" term of the Fourier series alone. For distributed loads, such as aerodynamic pressure, inertia loads, and aerodynamic heating, the Fourier series expansion is convenient since these loads vary smoothly in the circumferential direction. For the most general inertia loads, only the zeroth, first, and second terms of the series are necessary. For reasonably smooth pressure distributions, the same terms will usually describe the loading adequately for the purposes of the stress analyst. Concentrated point loads can also be described by Fourier series expansions. Although, in general, many terms are necessary for a good representation, the SATELLITE - 2S program (Reference 3) is available for automated computation of these terms.

Fundamentally different types of loading are represented by the various "harmonics". Pressure and temperature affect all harmonics. In addition, certain components of the three harmonics n = 0, 1, 2 reflect particular physical loads (see Reference 4, Appendix A).

- n = 0 (Zeroth Harmonic): This is the axisymmetric contribution. Loads are due to axial translational acceleration, and centrifugal forces. Net axial load is produced only by this type of loading.

- n = 1 (First Harmonic): This is the antisymmetric contribution. Loads are due to angular, centrifugal, and lateral translational accelerations. Net lateral load and a bending moment, which do not cause circular cross-sections to deform, are produced by this load contribution.

- n = 2 (Second Harmonic): Because of the character of the deformation, this is called the "ovalizing" contribution. Loads are due to centrifugal accelerations (see Reference 4, Appendix A).

No net loads can be obtained for $n \geq 2$; these higher harmonics contribute self-equilibrating loads due to pressure, temperature, and concentrated forces. For unsymmetric loading, the program will apply and sum all desired Fourier harmonic terms. A value V at a particular point (r_o, θ) on the shell is thus given by:

$$V(r_o, \theta) = \sum_{n=0}^{N} V^{(n)}(r_o) \cos n\theta$$

The user of the program has the option of obtaining only the final summed answers $V(r_o, \theta)$ at specified values of θ, or intermediate output from each harmonic also. The output is printed out for each segment of the shell at intervals specified by the user. In addition, an option for graphical display of each segment stresses and displacements is available.

In the case of a premature program termination due to time estimates in the execution of an unsymmetric loading problem, a restart capability is provided so that previous computations will not be wasted.

SECTION 2

INPUT INFORMATION

2.1 GENERAL NOTES

The preceding section provides some insight into the capability of the program, and the potential that it might have for future use. If the program is applied judiciously it can be an extremely powerful tool. The mechanics of applying it should be clearly understood. With this in mind, the remaining section should be studied carefully.

The required input data may be subdivided into three main parts, namely: geometric, topological (or coupling orientation) and joint data (degree of freedom description for each joint component). Each segment requires its own geometric configuration and numerical integration control.

The output consists of stiffness coefficients for each shell segment and the actual symmetry of the coefficients is presented in a convenient form for a check on the accuracy of the integration through the segment. Region stiffnesses and their symmetry checks are also provided. Final stresses, displacements and Huber-Von Mises-Hencky "effective stresses" are printed out for each shell segment at intervals along the segment as specified by the user of the program. The output will be further discussed in Section 3.

The present program size is described in the table below.

UNIVAC 1108 Table of Program Sizing

I.	Segments per region:	24
II.	Segment joints per region:	25
III.	Regions:	19
IV.	Region joints:	20

UNIVAC 1108 Table of Program Sizing (continued)

V.	Number of points available per segment for specifying geometric or load data:	30
VI.	Number of points available through the thickness for specifying temperature data:	4
VII.	Geometries:	ellipsoid, sphere, offset ellipsoid, modified ellipsoid, ogive, toroid, cone, annular plate, cylinder, general geometry, ring, elastic support, dummy geometry.
VIII.	Wall cross-section options:	single sheet, equal face sheet sandwich, unequal face sheet sandwich, eccentric reinforcement (rings, stringers or both), waffle reinforcement rotated at an arbitrary angle to coordinate axes, isogrid reinforcement, arbitrary stiffness input.
IX.	Number of material property tables per submission:	10
X.	Number of points per material property table:	10
XI.	Number of consecutive load conditions per submission:	10 (Except when summing harmonics or non-linear, = 1)
XII.	Orthotropy options:	isotropic or orthotropic sheet, isotropic or orthotropic sandwich, isotropic or orthotropic sandwich with different face sheet properties caused by thermal gradients, isotropic or orthotropic sheet or sandwich reinforced by different property rings or different property stringers or both, isotropic or orthotropic sheet or sandwich reinforced by a different property waffle system rotated by an angle β to coordinate axes, isotropic or orthotropic sheet or sandwich reinforced by a different property general isogrid reinforcing system, arbitrary stiffness input options used to describe other configurations.
XIII.	Number of harmonics in a multi-harmonic submission:	25

UNIVAC 1108 Table of Program Sizing (continued)

XIV.	Number of θ angles for description of circumferential variation:	36
XV.	Number of rings per region:	23
XVI.	Total number of rings at region joints in structure:	18
XVII.	Number of elastic supports:	20
XVIII.	Number of graphical display items:	56

Figure 2-1 shows the detailed option flow chart for the present program.

GENERAL NOTES - Idealizations

Before discussing the specific card input order, it would be advantageous to introduce some general guidelines in the area of idealizations and topology. In many computer programs there is such an abundance of numerical computation, that minimizing numerical roundoff errors becomes as important as getting the final answers. In some cases the engineer can aid the program in this effort through the use of judicious idealizations. Such a possibility exists in the STARS-2 programs, since many internal operations are involved with building and inverting stiffness matrices. The object of the user therefore, should be to help the computer by avoiding the creation of ill-conditioned matrices at any step (see Reference 5). Physically, the way to achieve this end is to have all the segment stiffness matrices of the same order of magnitude. This will in turn produce region stiffness matrices which are of similar orders of magnitude, and minimize possible ill-conditioning in the total structure matrices. The user can help to achieve this end by sizing his segments in such a way so that no short stiff segment is contained alone in a region with all other long flexible segments, or that no region comprised of all short stiff segments exists in a structure whose other regions contain only long flexible segments. No accurate measure can be given on the relative stiffness or flexibility of segments allowed, and thus the best check is to see if a structure is in equilibrium under the applied loading. It also must be kept in mind, that if an idealization has provided useful results for

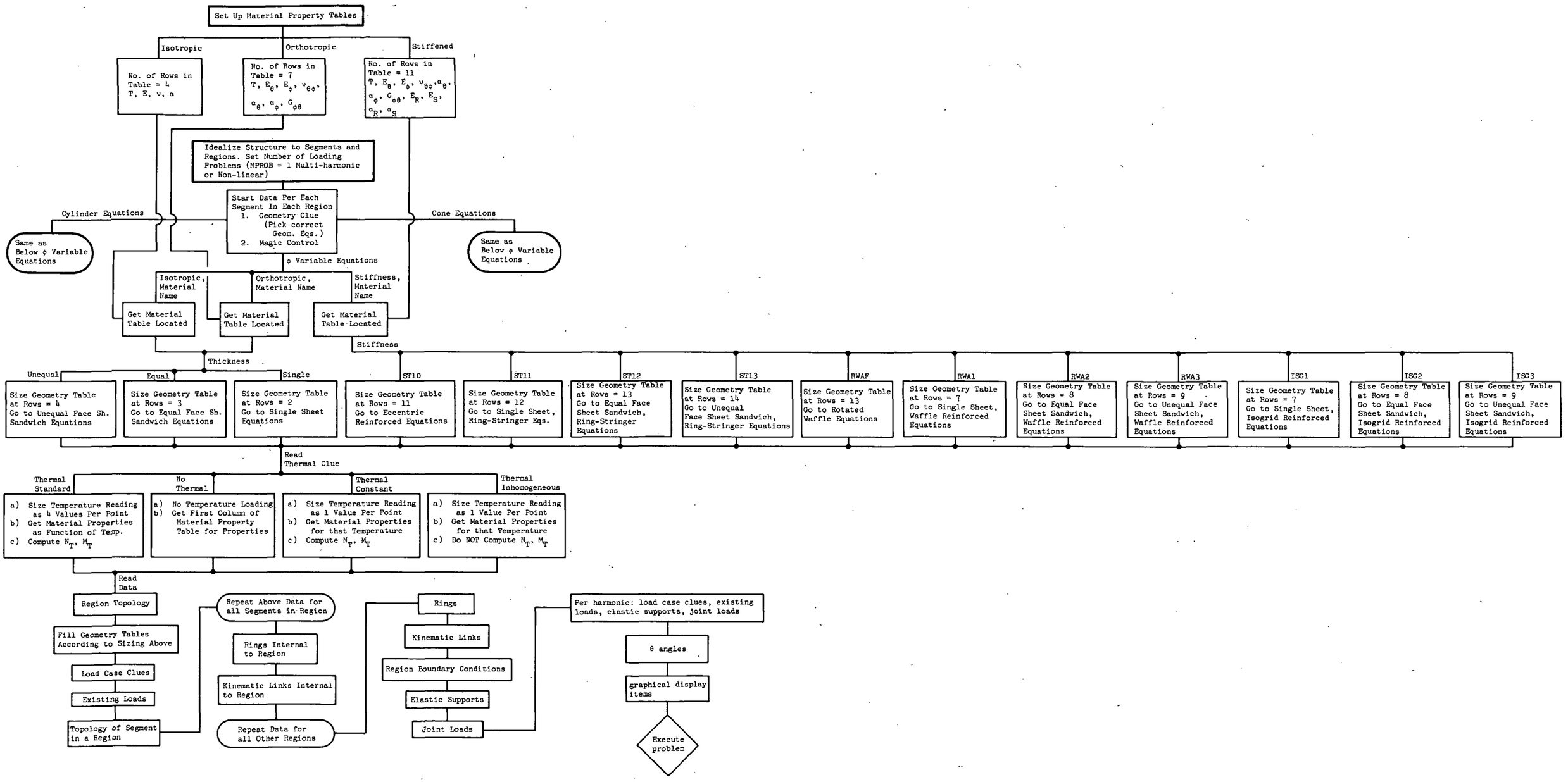


Figure 2-1. Program Option Flow Chart

axisymmetric (zeroth harmonic) loading, it need not necessarily be a good idealization for other harmonics, but if good results are obtained for the first harmonic, then other harmonics should also encounter no adverse behavior. The symmetry checks of segment and region stiffness matrices are useful for many reasons, but will not necessarily alert a user to ill-conditioning.

In the use of regions, one other type of accident must be avoided. This is the creation of a single region structure with both ends fixed, wherein no suitable boundary condition matrix can be formed. Thus, in the use of region idealizations, which are less physically meaningful to a user than pure segment idealizations, care should be taken so that all boundary conditions are not zeroed out. To avoid this problem, and to minimize program running time, it is best to maximize the number of regions in a structure, and minimize the number of segments per region. Thus, in small problems, for best numerical efficiency, there should only be <u>one</u> segment per region.

In the solution of problems involving only axisymmetric loads (n = 0) and no torsion, the torsional degrees of freedom should be removed. This will not affect the answers and will allow the program to work with smaller structure matrices.

<u>GENERAL NOTES - Multi-harmonic Runs</u>

As mentioned previously the STARS-2S program has the capability to analyze an unsymmetrical loading problem in one submission. In this case the user is given a printout option. Upon the insertion of a suitable clue on the data card, signifying no intermediate printout, the following printout will be provided:

1. Complete preliminary printout for the first harmonic input (to the region joint displacement matrix/see Section 3/).
2. Summed stress and deformation data versus the circumferential angle θ and meridional distance ϕ or s, at the end of program execution.

Upon the insertion of a suitable clue on the data card, requesting intermediate printout, the following printout will be provided:

1. Complete preliminary printout for the first harmonic input (to the region joint displacement matrix/see Section 3/).

2. Abbreviated stress and deformation data at all segment ends for this harmonic.

3. Segment and region stiffness and load matrices and symmetry checks for all other harmonics.

4. Abbreviated stress and deformation data at all segment ends for all other harmonics except the last.

5. Summed stress and deformation data versus the circumferential angle θ and meridional distance ϕ or s, at the end of program execution.

Since the solution of the unsymmetrical loading problem essentially requires the consecutive execution of a series of analyses, the program may be inadvertently cut off due to an insufficient time estimate. In order to allow the user to utilize the good data generated in such an aborted run, a restart option has been incorporated into the STARS-2S program. This option is used as follows:

1. After the complete execution of any harmonic, the name of the scratch tape presently containing all previously summed harmonic data is printed out as scratch tape SAVE 14 or scratch tape SAVE 15. Thus in any computer submission on which a bad time estimate can be made, instructions to the operator to save the tapes named SAVE 14 and SAVE 15 should be given. These two tapes are the ones mounted respectively on logical units 14 and 15.

2. Upon receipt of an aborted computer run the name of the tape containing the last completed harmonic can be obtained from the printout. This will be the restart tape; the other can be released.

3. In order to initiate a restart run the following must be done:

   a) One data card must be changed - the restart clue must be set to indicate a restart run.

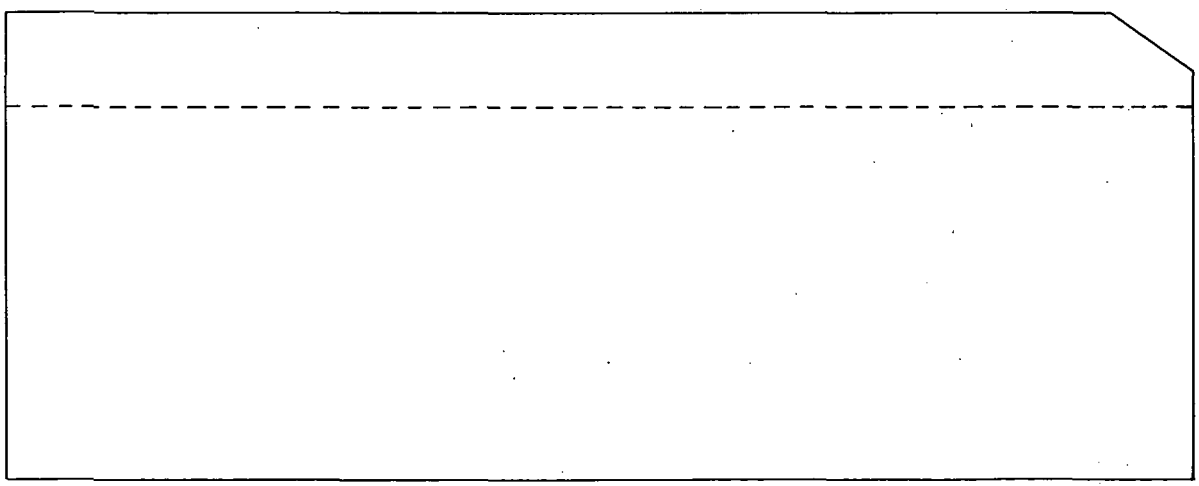
   b) Operator instructions must be given to mount the restart tape on logical unit 15 (regardless of the restart tape name). Another scratch tape will be mounted as usual on logical unit 14.

   c) The run will now proceed as normal. In case of a second run abort follow the instructions starting with item 2.

4. Note: The restart tape for any given run is not useable more than once. Upon the initiation of the computer run this tape becomes a scratch tape and additional information (more harmonic data) will be written on it.

GENERAL NOTES - Data debugging

The STARS programs have been provided with special separate data debugging packages called SATELLITE programs. In order to be able to debug as much of a given data deck as possible in one computer submission, the data is grouped by inserting special cards, termed "dash-separator cards", appropriately. In order so that additional errors are not made by requiring insertion and removal of these cards, the STARS program has been coded to accept these dash-separator cards in the input. A dash-separator card is shown below:



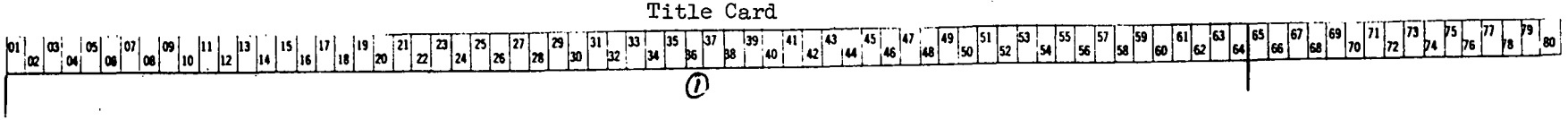
As can be seen, a minus symbol is inserted straight across the computer card from column 1 through column 80.

Since the dash-separator cards subdivide the data deck, there exists the possibility that a separated data block may be completely omitted (for example no kinematic links in a structure). In this case one dash-separator card is also omitted. Under no circumstances can there exist two adjacent dash-separator cards in a data deck. The SATELLITE programs are described in Reference 3.

2.2 CARD FORMATS

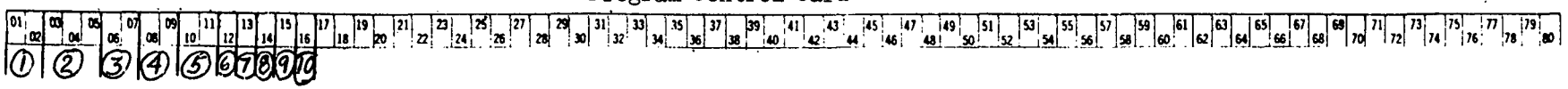
The following different card formats are presently required by the STARS-2S program. A full description and explanation of the information to be entered on the cards is presented in Section 2.3.

Title Card



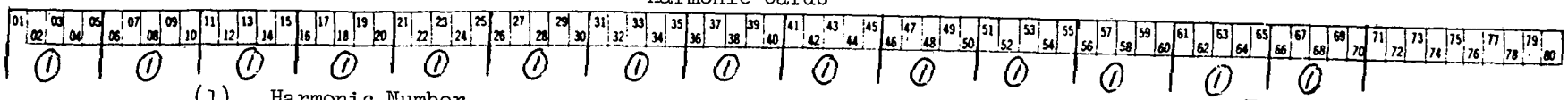
(1)	Alphameric Title	16A4

Program Control Card



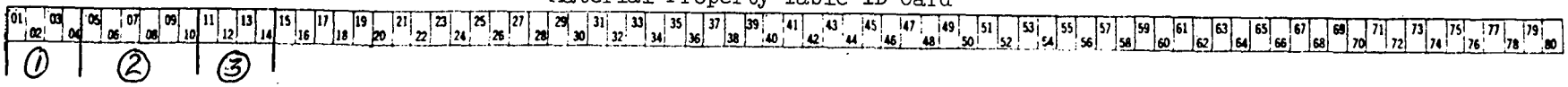
(1)	Number of regions	I2
(2)	Total number of segments	I3
(3)	Number of material property tables	I2
(4)	Number of superimposed harmonics	I2
(5)	Number of loading conditions	I2
(6)	Coupling code	I1
(7)	Restart clue	I1
(8)	Intermediate print clue	I1
(9)	Blank	-
(10)	Graphics clue	I1

Harmonic Cards



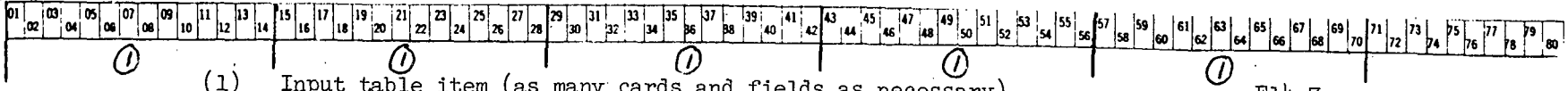
(1) Harmonic Number F5.0

Material Property Table ID Card



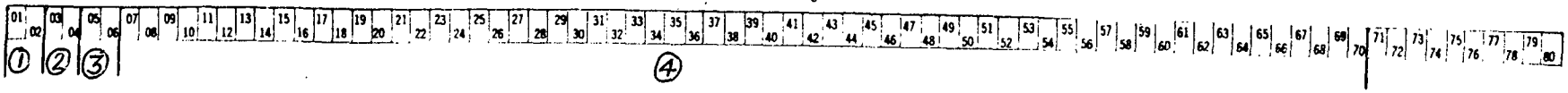
(1) Material Name A4
(2) Blank -
(3) Table Type A4

Materials Property Table Cards, Geometry Card, Position, Crossection, Loading, Nonlinear, Stress calculation, Ring-Thermal, and THETA Angle Cards.



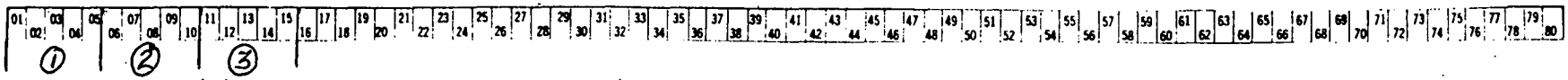
(1) Input table item (as many cards and fields as necessary) E14.7

Region Introductory Card



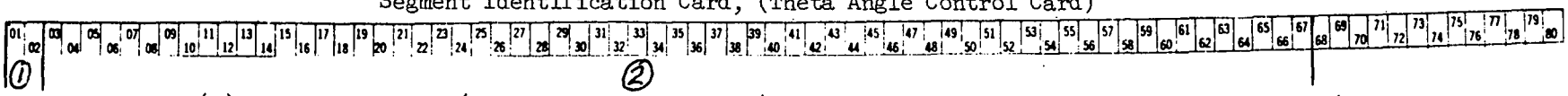
(1) Number of segments I2
(2) Number of kinematic links I2
(3) Number of rings I2
(4) Title 16A4

Topology Cards, (Region Joint Control Card)



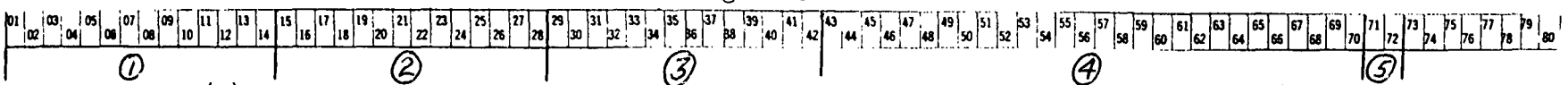
(1)	Region or segment number, (number of joints)	I5
(2)	Beginning joint, (number of rings)	I5
(3)	End joint, (number of links)	I5

Segment Identification Card, (Theta Angle Control Card)



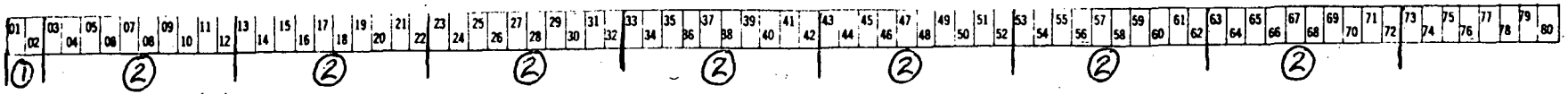
(1)	Segment code, (number of Theta angles)	F2.0, (I2)
(2)	Title	16A4

MAGIC Integration Card



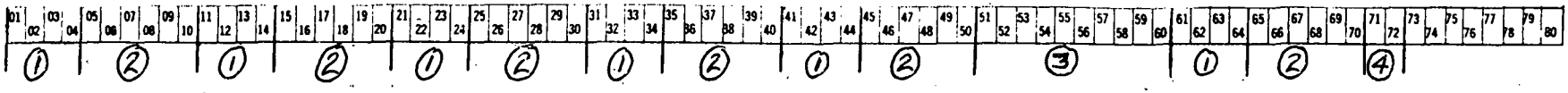
(1)	Print Interval	E14.1
(2)	Accuracy control	E14.1
(3)	Integration interval	E14.1
(4)	Blank	-
(5)	Step control	F2.0

Special Geometry Card for Point Input Shape



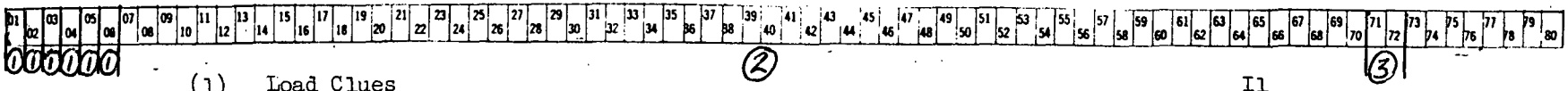
(1)	Number of input points	I2
(2)	Input points (as many pairs as specified)	F10.0

Master Clue Card, Stress Clue Card



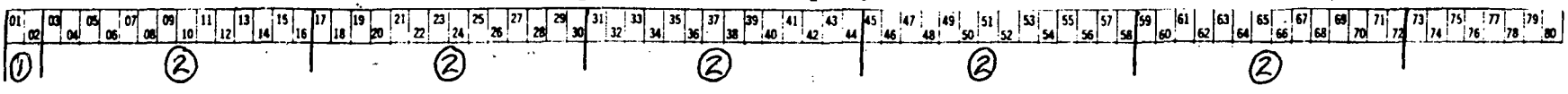
(1)	Clues	A4
(2)	Blank	-
(3)	Stress Free Temperature	E10.1
(4)	Number of Table points	I2

Loading Clue Card



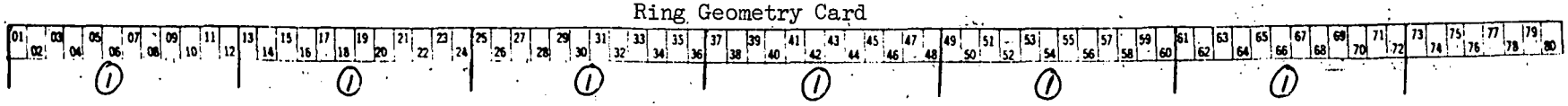
(1)	Load Clues	I1
(2)	Title	16A4
(3)	Table Control (on multi-harmonic cards)	I2

Ring Location and Property Card



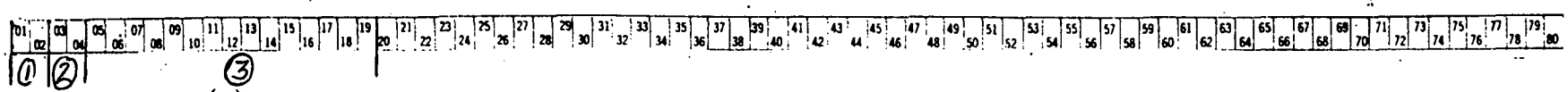
(1)	Ring joint number	I2
(2)	Ring properties	E14.7

Ring Geometry Card



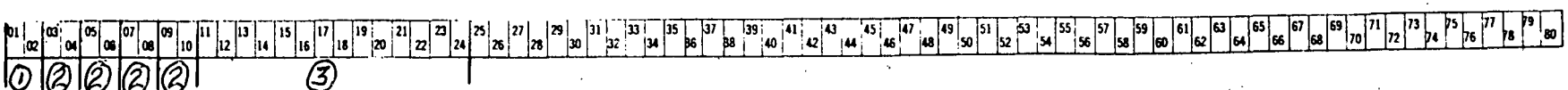
(1) Ring geometric properties — E12.5

Kinematic Link Cards



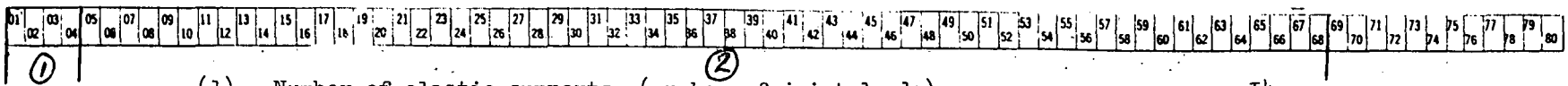
(1) Dependent joint — I2
(2) Independent joint — I2
(3) Angle of inclination — E14.7

Boundary Condition Card



(1) Joint Number — I2
(2) Boundary conditions — F2.0
(3) Axis rotation angle — E14.1

Elastic Support Control, (Joint Load Control) Cards

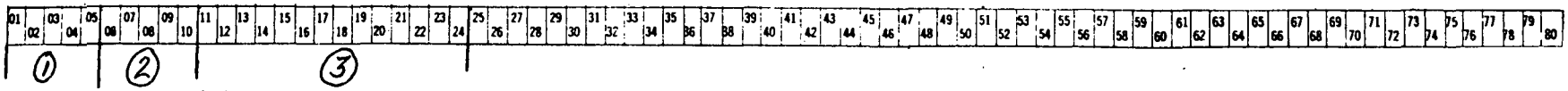


(1) Number of elastic supports, (number of joint loads) — I4
(2) Title — 16A4

Elastic Support Stiffness Cards

(1)	Joint Number	I5
(2)	Support stiffness constants	E14.7

Joint Load Cards



(1)	Load condition number	I5
(2)	Row Identification	I5
(3)	Applied load	E14.7

Graphics Control Card

(1)	Graphics Clues	I1
(2)	Blank	-

2-3 DETAILED ORDER OF INPUT (See Figures 2-1, 2-2)

GENERAL INTRODUCTORY CARDS	Column	Format
1. Title Card		
A. Alphameric title (submission description)	1-64	16A4
2. Program Control Card		
A. Number of regions to be coupled (Max. = 19)	1-2	I2
B. Total number of segments (Max. = 19 x 24 = 456)	3-5	I3
C. Number of Material Property Tables (Max. = 10)	6-7	I2
D. Number of Harmonics to be Superimposed (Max. = 25)	8-9	I2

If the loading is unsymmetric and the computer run is comprised of several harmonics the following restrictions must be followed:

a) The number of loading conditions must be one.
b) The problem must be linear (LINE clue on the master clue card).
c) If the loading contains thermal loads, and if the axisymmetric harmonic (n = 0.0) is included, then its description must be given first.

If a single harmonic is to be investigated the number of harmonics is set to one.

E. Number of loading conditions for this problem	10-11	I2

The user is able, for each problem submitted, to analyze his structure under several independent loading conditions (Max. = 10). The number of these loading conditions will determine the number of load clue cards which will be necessary per segment. If the run is to be non-linear or contain multi-harmonics to be superimposed, this number can only be unity (1).

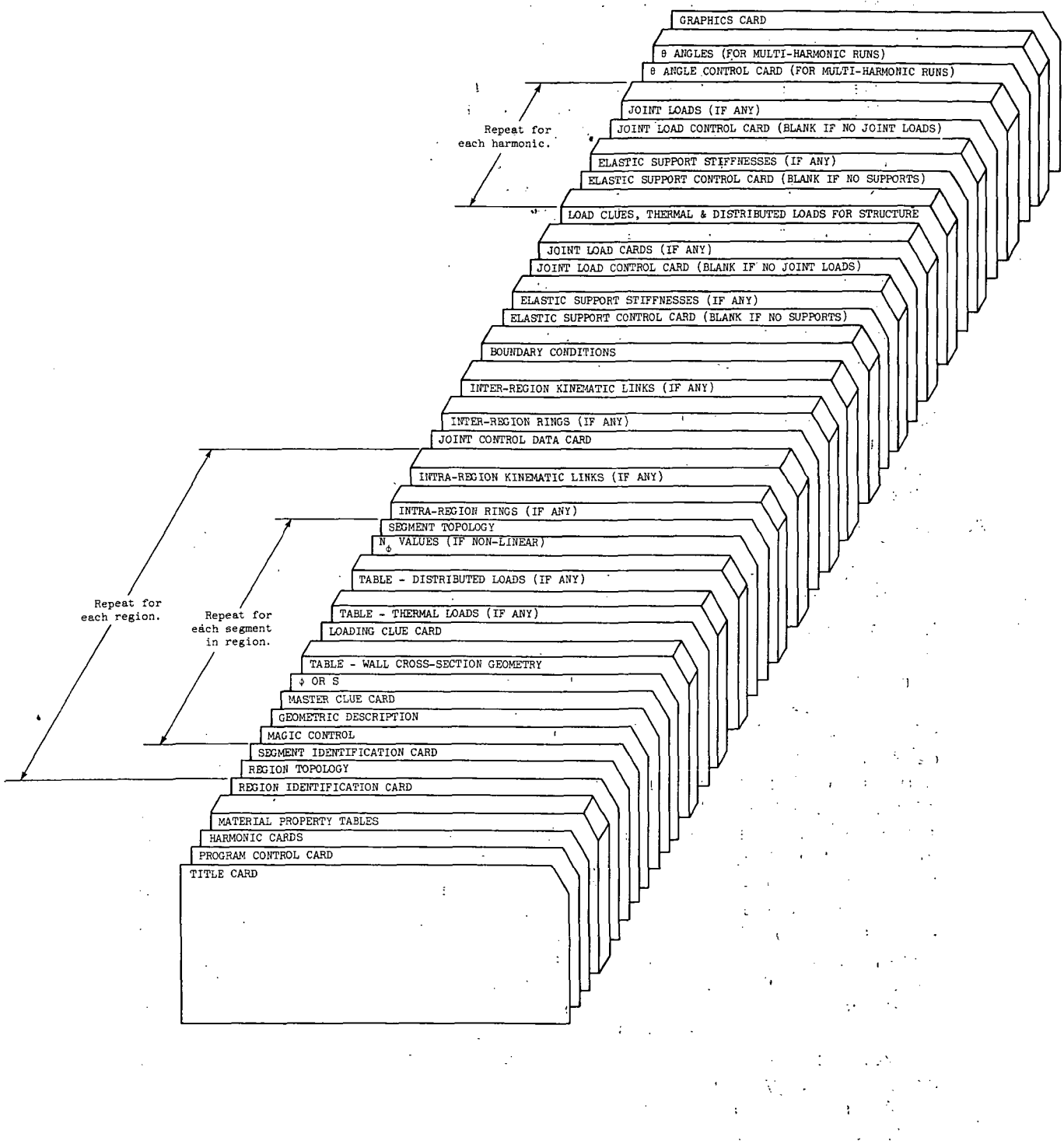


Figure 2-2. Data Sequence

Column	Format

In the case of a thermal load condition the following restrictions will exist:

a) Only the first loading condition can contain thermal loads.
b) The output answers will be provided as follows: The answers to the first mechanical and/or thermal loading condition will be provided. The answers to successive mechanical loading conditions will be superimposed upon the thermal load (only) answers of the first loading condition. This is due to the fact that the structure stiffness matrix generated was that of a hot structure with successive applications of mechanical loads.

Note: In a multi-harmonic submission, although only one loading condition is allowed, all the harmonics may contain thermal loadings.

F. Coupling code

		Column	Format
1. Coupling to occur	Code = 1	12	I1
2. No coupling	Code = 0 or blank		

Uncoupled runs present a way to size segments by use of stiffness symmetry checks, without a full execution of the problem. If no coupling occurs program will give only individual stiffness and load matrices of each segment; if coupling occurs the program will run to completion and give the state of stress and deformation of the entire structure. In uncoupled runs the number of regions is one (1), the total number of segments and the number of segments on the first region identification card should be the same, and kinematic link, discrete ring, boundary condition, elastic support, line load, θ angle, and graphics cards, and their accompanying dash-separator cards should be omitted. In addition, the second region introductory card (topology), and cards 10 through 12 of the segment cards are not included in an uncoupled run.

GENERAL INTRODUCTORY CARDS (continued)

	Column	Format
G. Restart clue	13	I1

1. Not a restart run clue = 0 or blank
2. Restart run clue = 1

For a single harmonic the restart clue is always equal to zero. For additional information on restarting runs see GENERAL NOTES - Multi-harmonic Runs (p. 2-6).

H. Intermediate print clue	14	I1

1. Intermediate print requested clue = 0 or blank
2. No intermediate print clue = 1

For additional information on intermediate print see GENERAL NOTES - Multi-harmonic Runs (p. 2-6), and Section 3.

I. Graphics clue	16	I1

1. Graphic plots requested clue = 1
2. Graphics not needed clue = 0 or blank

The graphics option is described later in this section with the graphics input card.

3. Harmonic Cards

A. The values of the harmonics to be considered in a multi-harmonic run (Max. No. = 25). (Up to 14 values on first card, and up to 11 values on second card if needed.)	1-70	14F5.0

MATERIAL PROPERTY TABLES (Max. = 10 sets)

As many sets of these cards are used (≤10) as there are different material property segments in the structure to be analyzed. These tables will be used to obtain the thermal variation of material properties if thermal loadings exist. Thus the range of temperature in this table should be greater than that of the thermal loads. If no thermal loads exist, the values given in the first column of this table will be used, and the rest of the table can be left blank. If there are thermal loads, the range of the table is to be considered as that between the second and tenth columns.

1. Identification Card

A. Material Title (Alphameric)	1-4	A4

Any name can be made up as long as it is consistently used on the segment cards to which it refers. The same name cannot appear on more than one (1) table.

MATERIAL PROPERTY TABLES (continued)

	Column	Format
B. Type of Table	11-14	A4

One of several possible alphameric clues is written here. These clues serve to size the number of cards in the property table, and define which properties belong on which card. The possible clues are:

ISOT
ORTH
STIF

Their definitions are provided in Item 2 below.

2. Material Property Cards

The material property cards below are given depending upon which table type clue is used. If the table type clue is "ISOT" (isotropic table):

A. Temperature values (5 values per card; 2 cards) — 5E14.7

These are the temperatures at which the values of material properties will be given. The first value in the table must always be the room or stress-free temperature, since the material properties in only the first column of the table will be used in an analysis involving no thermal load. The values of temperature in table columns 2 through 10 must be in algebraically increasing order.

B. Values of Young's Modulus at the given temperatures. (5 values per card; 2 cards) — 5E14.7

C. Values of Poisson's Ratio at the given temperatures. (5 values per card; 2 cards) — 5E14.7

D. Values of the thermal coefficient of expansion at the given temperatures. (5 values per card; 2 cards) — 5E14.7

If the table type clue is "ORTH" (orthotropic table):

A. Temperature values (5 values per card; 2 cards) — 5E14.7

These are the temperatures at which the values of material properties will be given.

B. Values of Young's Modulus in the θ direction (E_θ) at the given temperatures. (5 values per card; 2 cards) — 5E14.7

MATERIAL PROPERTY TABLES (continued)

	Column	Format
C. Values of Young's Modulus in the ϕ direction (E_ϕ) at the given temperatures. (5 values per card; 2 cards)		5E14.7
D. Values of the Poisson's Ratio $\nu_{\theta\phi}$ at the given temperatures. (5 values per card; 2 cards)		5E14.7
E. Values of the thermal coefficient of expansion in the θ direction (α_θ) at the given temperatures. (5 values per card; 2 cards)		5E14.7
F. Values of the thermal coefficient of expansion in the ϕ direction (α_ϕ) at the given temperatures. (5 values per card; 2 cards)		5E14.7
G. Values of the Shear Modulus $G_{\phi\theta}$ at the given temperatures. (5 values per card; 2 cards)		5E14.7

If the table type is "STIF" (table to be used for reinforced shells):

A.-G. The values in these locations are the same as those above for the "ORTH" clue case, and refer to the basic shell.		5E14.7
H. Values of ring Young's Modulus (E_R) at the given temperatures. (5 values per card; 2 cards)		5E14.7
I. Values of stringer Young's Modulus (E_s) at the given temperatures. (5 values per card; 2 cards)		5E14.7
J. Values of ring thermal coefficient of expansion (α_R) at the given temperatures. (5 values per card; 2 cards)		5E14.7
K. Values of stringer thermal coefficient of expansion (α_s) at the given temperatures. (5 values per card; 2 cards)		5E14.7

Note: In a rotated waffle or isogrid construction, items H and I, and J and K, refer to the grid directions and are respectively identical.

D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D — minus in 1-80
(See General Notes - Data Debugging)

REGION INTRODUCTORY CARDS	Column	Format

These two cards are placed at the beginning of each region data information. Each region contains the following data set (see Figure 2-2): a) Two region introductory cards; b) data cards for each segment within the region; c) ring cards describing the discrete rings within the region, if any; and d) kinematic link cards describing the kinematic links within the region, if any.

1. Identification Card

A.	Number of segments within the region (≤ 24)	1-2	I2
B.	Number of kinematic links between segments within the region.	3-4	I2
C.	Number of discrete rings between segments within the region.	5-6	I2
D.	Any alphameric information (region description)	7-70	16A4

2. Topology Card (Coupling Orientation)

A.	Region Number Number of the region under consideration.	1-5	I5
B.	Joint (i) Joint associated with i^{th} (beginning) end of the region.	6-10	I5
C.	Joint (j) Joint associated with j^{th} (ending) end of the region.	11-15	I5

There is no coordinate flow in regions (unless 1 region = 1 segment), such as that shown for segments in Figures 2-3 to 2-9. However, the start joint of a region must match with 1 in segment numbering, and the end joint must match with the highest segment joint number in the region (see Figure 2-12 and page 2-54). If 1 region = 1 segment the segment topology card will be a dummy card [1 1 2] (see page 2-54).

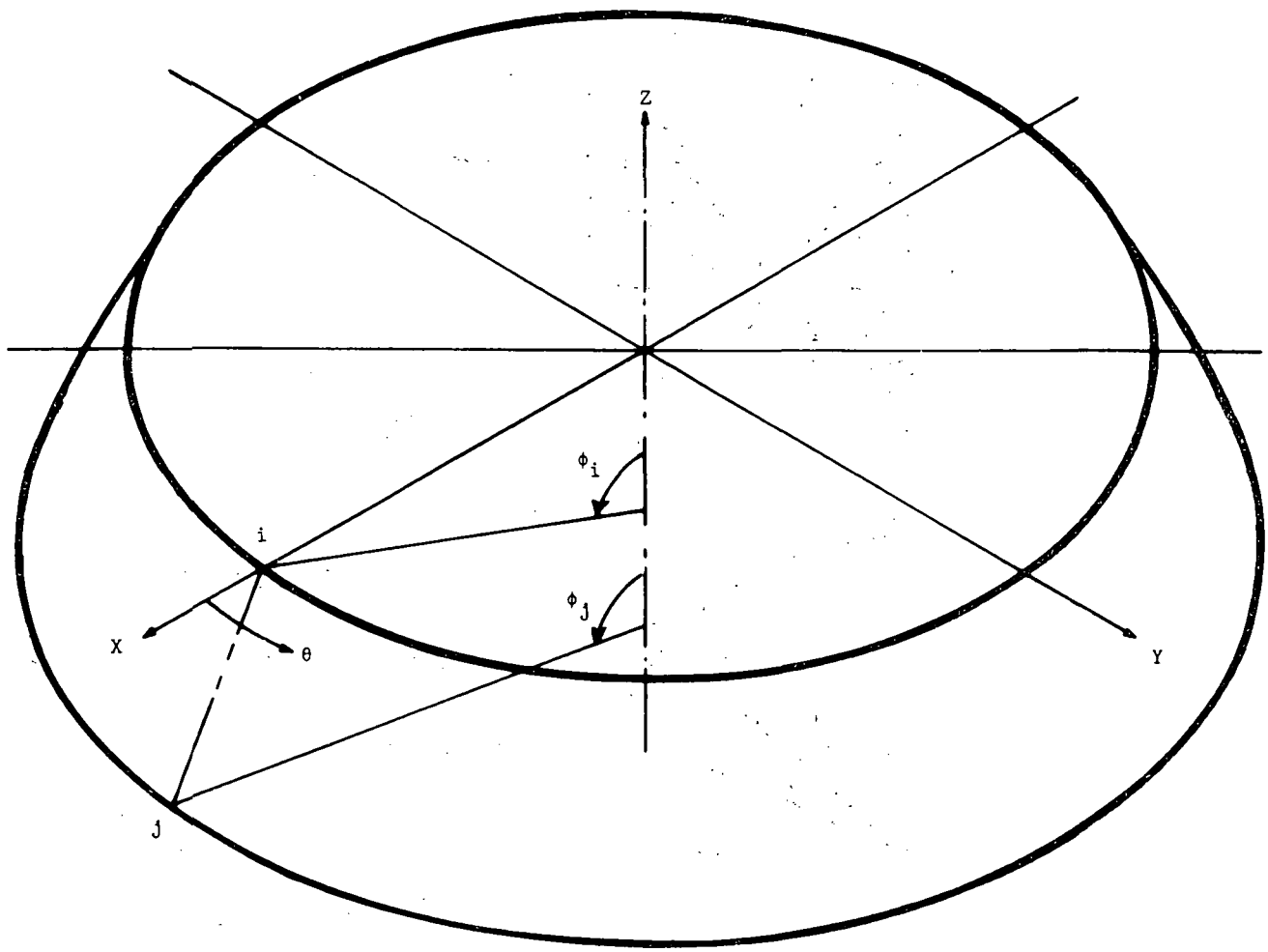
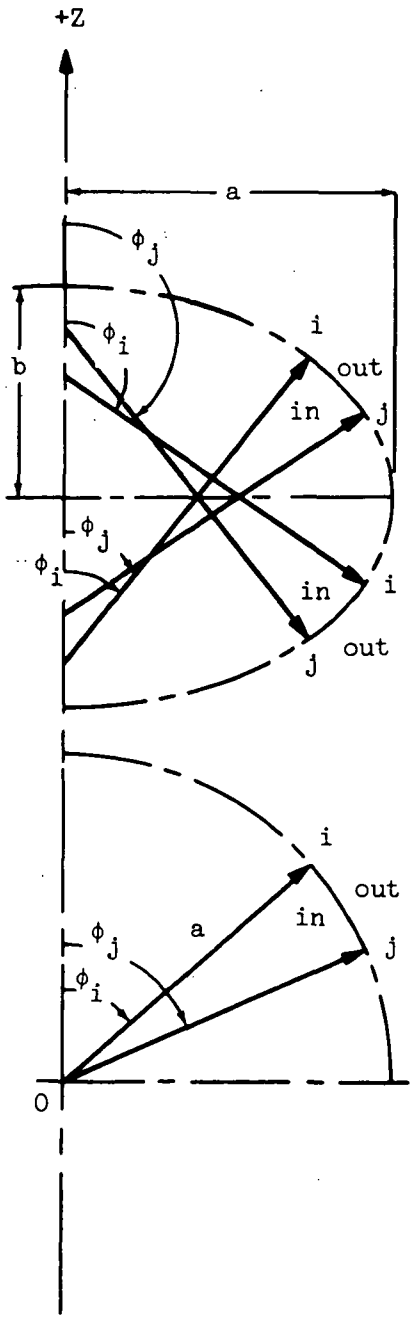


Figure 2-3. Typical Shell Segment



Top Ellipsoid

Specify a, $\beta = \frac{b}{a}$, C=0

Bottom Ellipsoid

Sphere

Specify a, $\beta = 1$
or use ogive with
$r_1 = a$, $C = 0$

Figure 2-4a. Ellipsoid

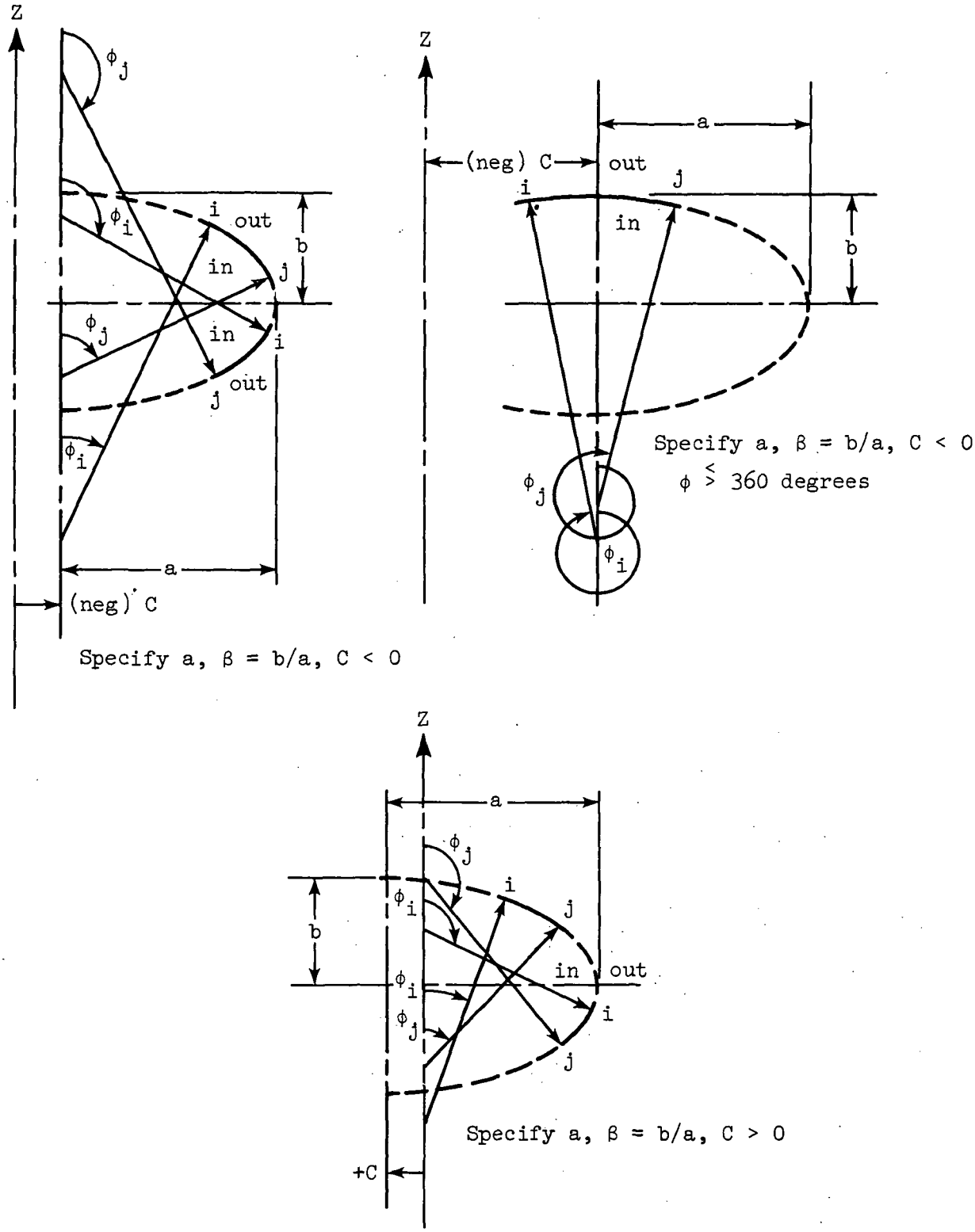
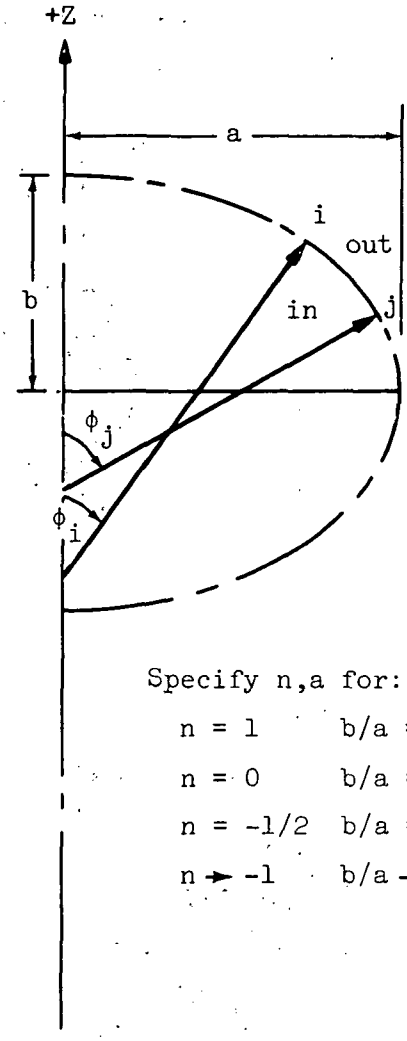


Figure 2-4b. Translated Ellipsoid



Specify n,a for:

n = 1	b/a = 0.707
n = 0	b/a = 0.666
n = -1/2	b/a = 0.639
n → -1	b/a → 0.618

Figure 2-5. Modified Ellipsoid

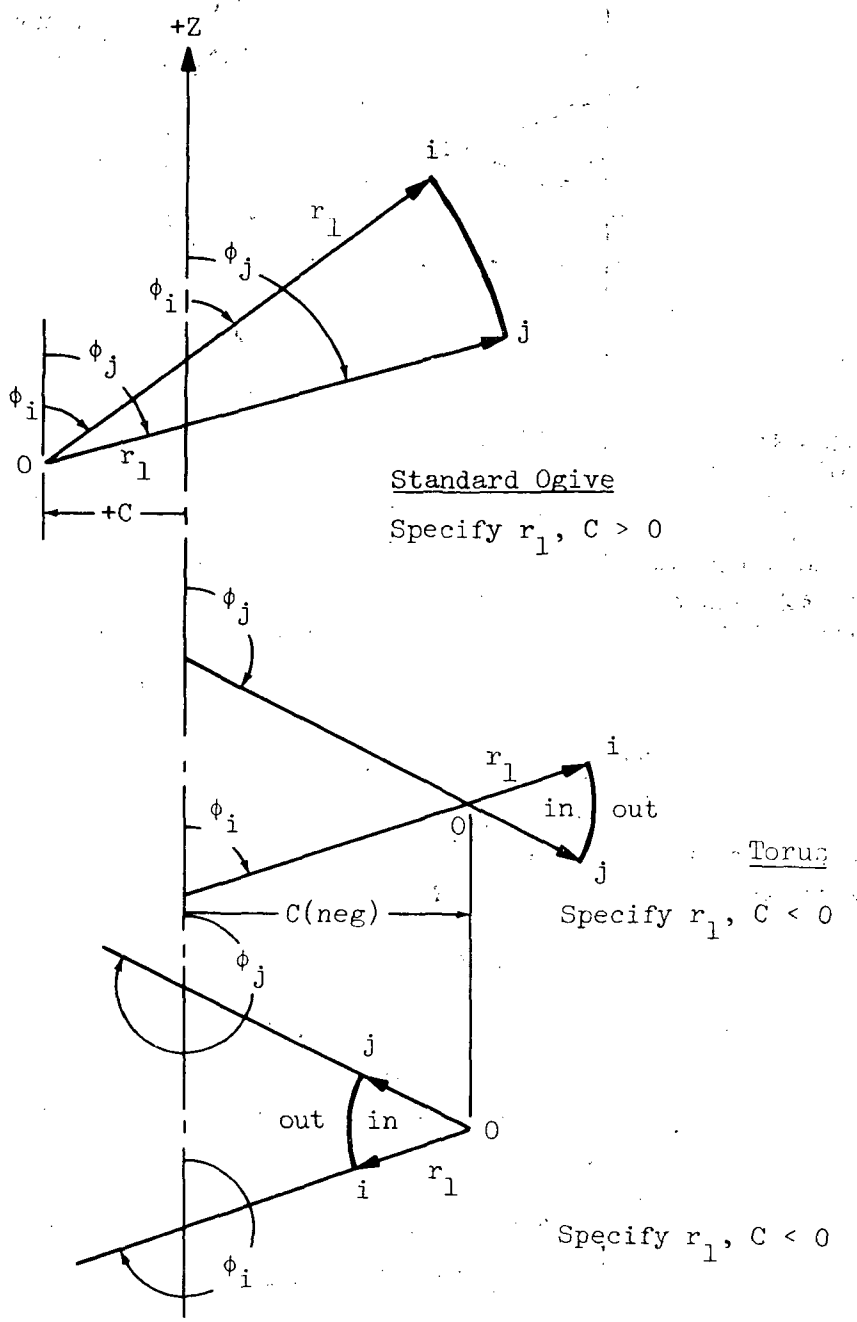
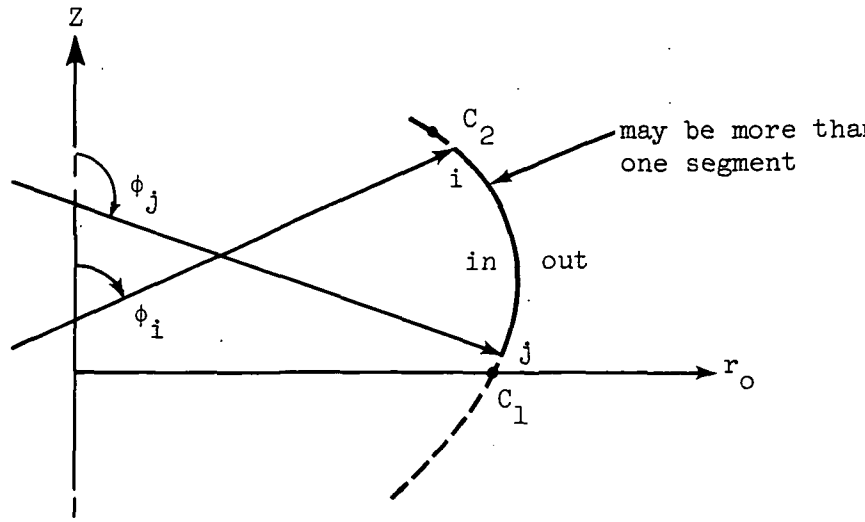


Figure 2-6. Ogive

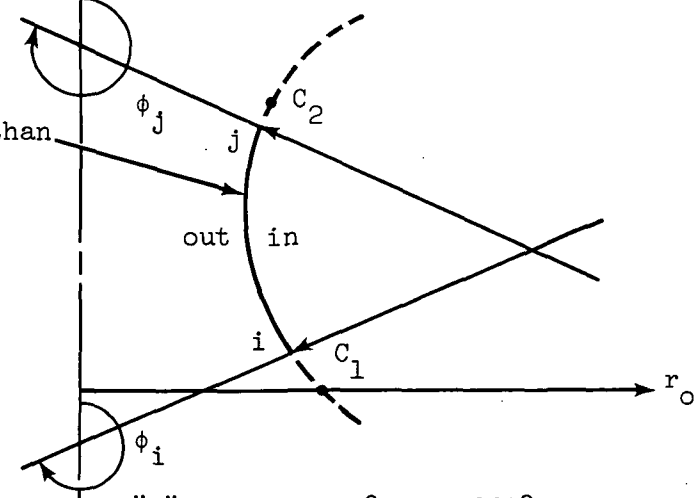


In the ranges of ϕ
$0° \leq \phi < 10°$
$170° < \phi < 190°$
$350° < \phi \leq 360°$
spherical, toroidal or elliptical segments can be used with sufficient accuracy.

"B" shape $10° \leq \phi \leq 170°$

Specify: Z versus r_o starting with
Z = 0 at C_1, and going to C_2.

Note: Z vs r_o input table should overlap <u>total</u> range of ϕ input for <u>all</u> segments.



"A" shape $190° \leq \phi \leq 350°$

Specify: Z versus r_o starting with
Z = 0 at C_1, and going to C_2.

Note: Z vs r_o input table should overlap <u>total</u> range of ϕ input for <u>all</u> segments.

Figure 2-7. General Geometry

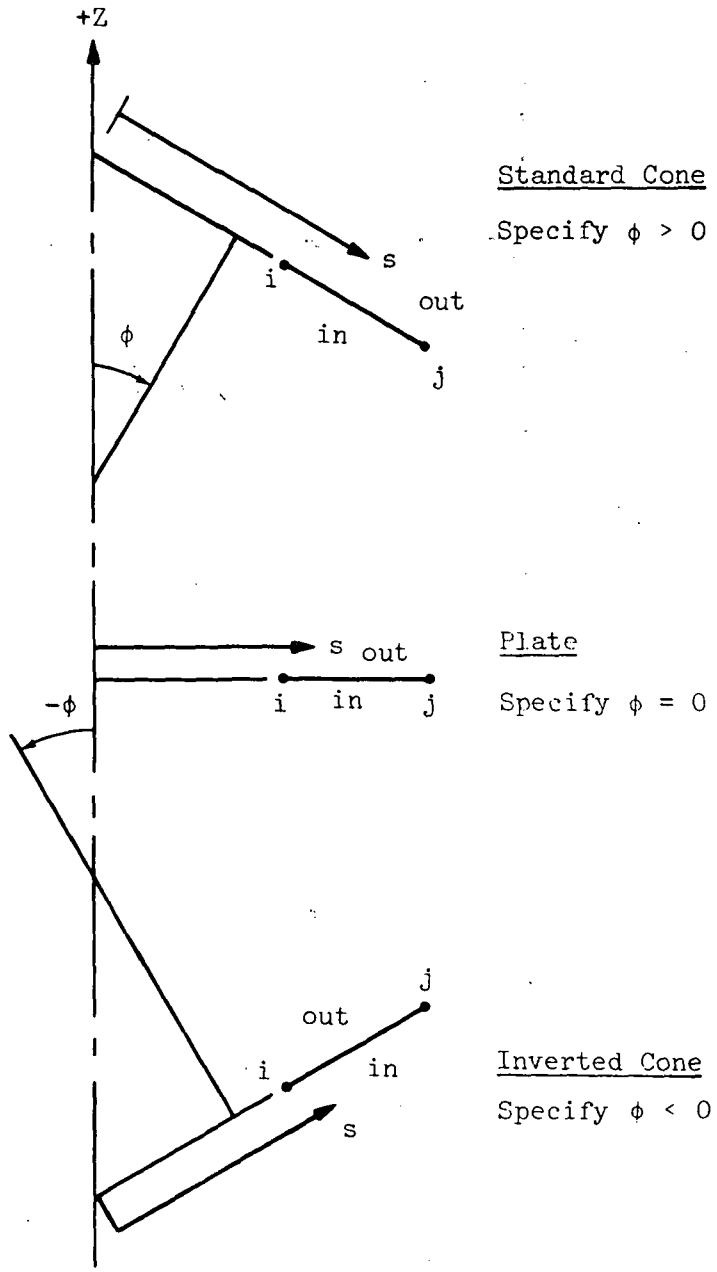


Figure 2-8. Cone

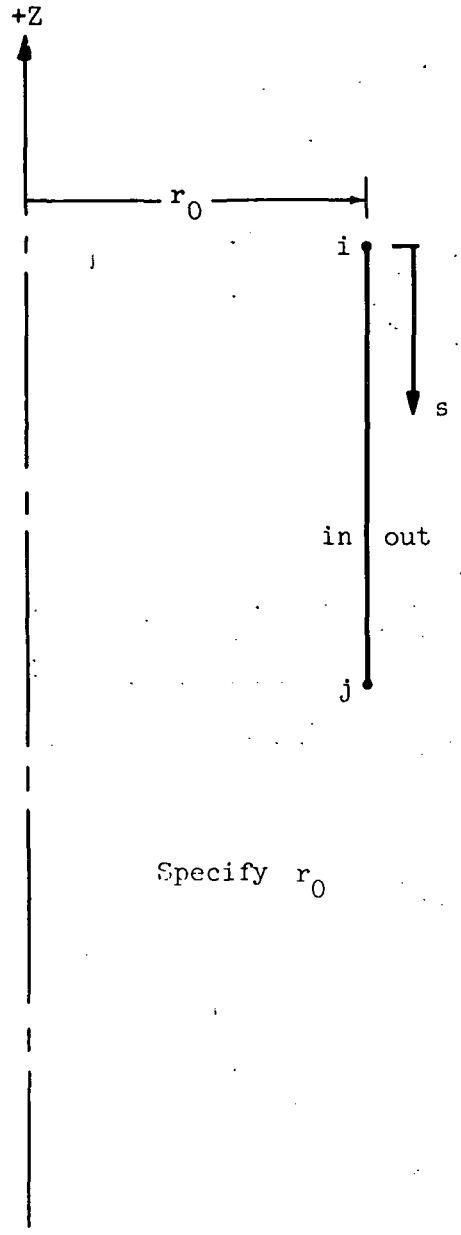
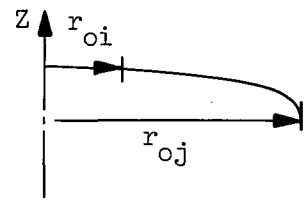


Figure 2-9. Cylinder

SEGMENT CARDS		Column	Format
This sequence of cards is repeated for each segment within the region.			
1. Identification Card			
A. Segment identification code (see Figures 2-4 to 2-9)			
1. Ellipsoidal or spherical shell	Code = 11	1-2	F2.0
2. Modified ellipse shape	Code = 12	1-2	F2.0
3. Ogival - Toroidal	Code = 13	1-2	F2.0
4. General Geometry (see Figure 2-7)	Code = 14A or 14B	1-3	F2.0A1
5. Dummy geometry slot (ϕ coordinate)	Code = 15	1-2	F2.0
6. Conical - Circular Plate	Code = 21	1-2	F2.0
The plate is treated as a cone with zero angle.			
7. Cylindrical shell	Code = 31	1-2	F2.0
B. Any alphameric information (segment description)		4-67	16A4
2. "MAGIC" Control Card			
A. Interval at which final answers are to be printed (in radians or inches).		1-14	E14.1
The ϕ-coordinate is defined for all geometric shapes except the cylinder, cone and plate, for which the s coordinate is used. Figures 2-4 through 2-9 describe these coordinates for each shape.			
B. Difference		15-28	E14.1
The value recommended depends upon the computer used. For eight figure accuracy computers it is 1.0 E-6; for the IBM 360 it is 1.0 E-4.			
C. Integration interval		29-42	E14.1
The Runge Kutta numerical integration procedure is substantially more accurate than finite differencing. An interval of (.03 to.06) x segment size (in radians or inches) should be sufficiently accurate for static analyses. (In using a 30 point segment table (see p.2-37) there should be at least 30 integration steps.)			
D. Delta		71-72	F2.0
For a fixed-step integration, Delta = 0.			
This card controls the Runge-Kutta numerical integration scheme. The suggested values above yield accurate results for a fixed-step integration method.			

Calculation of Segment Length

There is a restriction on the length of the shell segments. Physically, the restriction demands that boundary disturbances at one edge be distinctly felt at the other edge. This is a consequence of using a numerical integration procedure. Since the segment stiffness matrices must be symmetric, the calculations involved in obtaining each matrix element must be such that a computer round off error never becomes prominent. Limiting the segment length insures satisfaction of this criterion. This length is a function of both geometric shape and segment location within a specific geometry. One of the limiting factors is that the ratio of the radii of revolution at the initial and final points of a segment be greater than one hundredth and less than one hundred. Thus $\frac{1}{100} < \left(\frac{r_{oi}}{r_{oj}}\right) < 100$ where:



This requires smaller segments than will normally be predicted by formula in the area of an apex. In addition, note that ($\phi = 0$) is not an acceptable input point (except for the torus-ogive or offset ellipsoid).

For a cylinder, the segment length parameter,

$$\Lambda = (1 + \gamma)^{\frac{1}{2}} \beta \Delta s$$

should be held to about 4.0. In this expression, "γ" is a non-linear parameter. For homogeneous shells:

$$\gamma = \left[3(1 - \nu^2)\right]^{\frac{1}{2}} \left(\frac{\bar{N}_\phi r_o}{EH^2}\right)$$

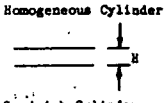
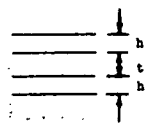
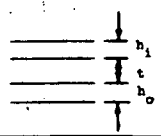
It is zero for a linear problem.

"β" is a measure of the rate of decay of a disturbance in the shell.

"Δs" is the meridional length.

$r_o = r_2 \sin \phi$

The values of β^4 and Δs for various shell geometries are given below:

	β^4	For $\nu = 0.3$, $\Lambda \leq 4$
Homogeneous Cylinder 	$\beta^4 = \frac{3(1-\nu^2)}{r_0^2 H^2}$	$\Delta s \leq \frac{3.11(r_0 H)^{\frac{1}{2}}}{(1+\gamma)^{\frac{1}{4}}}$
Sandwich Cylinder - Equal Face Sheets 	$\beta^4 = \frac{3(1-\nu^2)}{r_0^2(4h^2+6ht+3t^2)}$	$\Delta s \leq 3.11\left[r_0^2(4h^2+6ht+3t^2)\right]^{\frac{1}{4}}$
Sandwich Cylinder - Unequal Face Sheets 	$\beta^4 = \frac{3(1-\nu^2)}{(h_i+h_o)^4+12h_ih_ot(h_i+h_o+t)}\left[\frac{h_i+h_o}{r_0}\right]^2$	$\Delta s \leq 3.11\left[\frac{r_0}{h_i+h_o}\right]^{\frac{1}{2}}\left[(h_i+h_o)^4+12h_ih_ot(h_i+h_o+t)\right]^{\frac{1}{4}}$

Approximate formulas can be obtained for near cylindrical regions of generally curved surfaces. The length parameter,

$$\Lambda = (1+\gamma)^{\frac{1}{2}} \lambda \Delta\phi$$

should be held to about 4.0. In this expression "γ" has the same definition as in the cylinder case.

"λ" is a measure of the rate of decay of a disturbance in the shell.

"$\Delta\phi$" $= \frac{\Delta s}{r_1}$ is the angle intercepted by a meridional arc length "Δs".

The values of λ^4 and Δs for various shell geometries are given below:

	λ^4	For $\nu = 0.3$, $\Lambda \leq 4$:
Homogeneous Construction	$\lambda^4 = 3(1-\nu^2)\frac{r_1^4}{r_2^2 H^2}$	$\Delta s \leq \frac{3.11(r_2 H)^{\frac{1}{2}}}{(1+\gamma)^{\frac{1}{4}}}$
Sandwich Construction - Equal Face Sheets	$\lambda^4 = \frac{3(1-\nu^2)r_1^4}{r_2^2(4h^2+6ht+3t^2)}$	$\Delta s \leq 3.11\left[r_2^2(4h^2+6ht+3t^2)\right]^{\frac{1}{4}}$
Sandwich Construction - Unequal Face Sheets	$\lambda^4 = \frac{3(1-\nu^2)r_1^4}{(h_i+h_o)^4+12h_ih_ot(h_i+h_o+t)}\left[\frac{h_i+h_o}{r_2}\right]^2$	$\Delta s \leq 3.11\left[\frac{r_2}{h_i+h_o}\right]^{\frac{1}{2}}\left[(h_i+h_o)^4+12h_ih_ot(h_i+h_o+t)\right]^{\frac{1}{4}}$

The minimum allowable segment length is 1×10^{-3} (inches or radians according to segment sizing).

	Column		Format
3. Geometric Description Card			
A. Ellipsoid and sphere (Figure 2-4)			
1. Semi-axis perpendicular to Z-direction (a)	1-14		E14.1
2. Ratio of semi-axis in the Z-direction (b) to (a), $\beta = \left(\frac{b}{a}\right)$	15-28		E14.1
3. C = offset distance (±) (C = 0.0 if no offset)	29-42		E14.1
B. Modified ellipse shape (Figure 2-5)			
1. Axis ratio coefficient (n)	1-14		E14.1
2. Semi-axis perpendicular to Z-direction (a)	15-28		E14.1
C. Ogive (Figure 2-6)			
1. r_1 = radius	1-14		E14.1
2. C = offset distance (±)	15-28		E14.1
D. General Geometry (Figure 2-7)			
1. Number of pairs of Z versus r_o points (≤14)	1-2		I2
2. Z versus r_o points, in pairs, starting	3-72		F10.0
with Z value (7 values per card, including first card, for up to 4 cards total).	1-70	or	F10.0
In the input table the first Z value is taken as $Z_1 = 0$, and furthermore $Z_i > 0$ ($i = 2 - 14$) (see Figure 2-7).			
E. Cone (Figure 2-8)			
1. Angle ϕ in radians (for flat plate, $\phi = 0$). Keep in mind that this ϕ is a constant for a given cone and should not be confused with the ϕ on the MAGIC Control Card.	1-14		E14.1
F. Cylinder (Figure 2-9)			
1. Radius	1-14		E14.1

4. Master Clue Card

This card contains a series of clues which determine the program and table locations to be used for the segment being described. For a master flow chart of clues and options in the program see Figure 2-1.

	Column	Format

Note: In a multi-harmonic submission the master clue card is fixed for all harmonics. Thus for each segment the thermal load clue for each harmonic must correspond to the thermal clue on the master clue card.

A. Material Table Type Clue — 1-4 — A4

This clue defines the type of material property table to be expected for the segment. This, as well as the following clue determines the material properties that will be used in the structural analysis for the segment. Thus these two clues should match the two clues used on the identification card of the corresponding material property table. As mentioned before on page 2-19, the three possibilities are:

ISOT
ORTH
STIF

B. Material Title — 11-14 — A4

This name should be the same as the name which appears on the material property table which contains the properties to be utilized for this segment.

C. Sheet Clue — 21-24 — A4

This clue informs the program as to what kind of shell wall crossection to expect. If the shell is of single sheet construction, the clue to be used is: SING. If the shell wall is an equal-size face sheet sandwich, the clue to be used is: EQUA. If the shell wall is a sandwich but the face sheets are not equal, the clue to be used is: UNEQ. Finally, if the shell segment is reinforced by rings, stringers, a waffle, or an isogrid, the clue to be used is: BLAN.

D. Reinforcement Clue — 31-34 — A4

This clue describes the type of reinforcement that is present on the shell. If the shell is purely of single sheet or equal or unequal-size face sheet honeycomb construction (no reinforcing), the clue to be used is: THIC. If the reinforcement consists of rings or stringers or both, located along the coordinate axes (θ and ϕ or s), three clues are possible depending upon the basic shell wall construction. If the basic

wall construction is a single sheet, the clue to be used is ST11. If the basic shell wall is an equal-size face sheet sandwich, the clue to be used is ST12. If the basic shell wall is a sandwich but the face sheets are unequal, the clue to be used is ST13. If the reinforcement consists of a waffle which is rotated at an arbitrary angle β from the meridional axis the following three clues are possible depending upon the basic shell wall construction. If the basic wall construction is a single sheet, the clue to be used is RWA1. If the basic shell wall is an equal-size face sheet sandwich, the clue to be used is RWA2. If the basic shell wall is a sandwich but the face sheets are unequal, the clue to be used is RWA3. If the reinforcement consists of an isogrid construction of general angle β from the meridional axis (normally $\beta = 30°$) the following three clues are possible depending upon the basic shell wall construction. If the basic wall construction is a single sheet, the clue to be used is ISG1. If the basic shell wall is an equal-size face sheet sandwich, the clue to be used is ISG2. If the basic shell wall is a sandwich but the face sheets are unequal, the clue to be used is ISG3. Two other clues are available, namely ST10 and RWAF, if the user wishes to input his own stiffness constants. These constants may represent any wall construction as long as the basic Hooke's Laws used with the clues are appropriate to describe the construction to be considered. The Hooke's Laws used with these clues are given under the description of segment card set 6.

Note: The reinforcement described in the segment cards is closely spaced reinforcement which will be smeared over the segment. Discrete rings at segment ends in a region are described at the end of all segment data for that region.

E. Thermal Clue — 41-44 — A4

This clue describes the type of thermal problem which exists in the segment. The user is reminded that if there is a thermal loading on the structure, subsequent mechanical load cases will be superimposed on the hot structure (see page 2-17). If there is no thermal load on the segment, the clue to be used is NOTH. If the thermal loading on the segment is of a general, standard type, that is if there is variation

		Column	Format
	of temperature through the thickness as well as in the coordinate directions, the clue to be used is THST. If the thermal load is such that the variation is all in the coordinate directions, and there is no thermal variation through the thickness, the clue to be used is THCN. The last clue concerns a shell which is inhomogeneous in the meridional direction. This is not really a thermal problem at all, but merely a manipulation of the material property tables. If a structure has a wide variation in material properties in the meridional direction, without this last option one must take short segments of constant properties for analysis. With this option, however, the property variation is placed in the material property table, and expressed on the segment as a function of temperature. No thermal loads are calculated, however, and the temperatures are only used to interpolate for material properties as integration is progressing along the segment. Thus continual variation of properties in the meridional direction is accommodated. The clue for this option is THIN.		
	Note: The program cannot accommodate material properties varying in the hoop direction. Thus if, in a multi-harmonic submission, a thermal load must be described by several harmonics, the n = 0.0 information must be provided first. The hot shell material properties are then obtained for this case, and used for all other harmonics.		
F.	Stress-free Temperature	51-60	E10.1
	The value of the temperature (usually room temperature) at which the segment has no thermal stresses or distortions induced, is provided here. This is the temperature at which the shell was manufactured. If the analysis consists of multi-harmonic thermal loads and this value is input as other than zero (as would be the case if if ΔTs are input as loads), all the harmonic amplitude Ts should be of such magnitude that this temperature can be subtracted from each to obtain the ΔT in each harmonic. If there is to be no thermal analysis, this value is not used and can be set to zero (0.0).		

	Column	Format
G. Non-Linear Clue If the analysis is to be linear the clue is LINE. For a non-linear analysis see Reference 1 Section 7 and use the clue NPHI. This latter clue is only applicable in a single harmonic (n = 0.0) run.	61-64	A4
H. Table control - Number of points in each of the following tables. This can vary from 2 to 30 depending upon the shell geometry and loading. For a linearly varying geometry and/or loading only 2 input points would be required. These two points would be the end points. For more general loading and/or geometry a larger number of points are required. In particular, each abrupt change is specified by two points. One should use as many points as necessary (up to 30) in order to completely describe the problem, rather than using very short segments.	71-72	I2

5. Table of ϕ or s Values

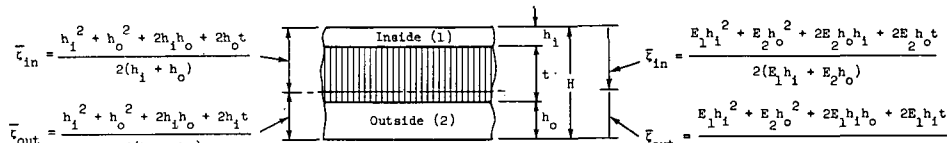
A. Initial, intermediate and final values of ϕ or s. Each point requires 14 columns on a card and thus there can be 5 values per card and up to 6 cards to make a total of up to 30 points. The points to be specified are the beginning point of the segment, any point of discontinuity, and the end point of the segment. The input must be consistent with item H of the previous card.		5E14.7

6. Table of Wall Crossection Geometry

The contents of these cards (up to 6 cards per item below) are dependent upon the clues registered on the Master Clue Card. If the shell to be described contains no reinforcing, the pertinent clue is item 4C, the Sheet Clue. The geometry is input and the stiffnesses are calculated by the program (see Figure 2-10). The input is presented below as a function of the Sheet Clue.

If the Sheet Clue is SING (single sheet construction):

A. Initial, intermediate and final values of wall thickness (h_i) at points defined by table of ϕ or s values.		5E14.7



E,ν, Constant through thickness

Unequal material properties for the face sheets.
Restriction: properties are such that a neutral plane exists.

Configuration	Extensional Stiffness	Flexural Stiffness	Shear Stiffness
h_i Ortho-tropic	$K_{11} = \frac{E_\theta h_i}{1 - \nu_{\phi\theta}\nu_{\theta\phi}}$ $K_{22} = \frac{E_\phi h_i}{1 - \nu_{\phi\theta}\nu_{\theta\phi}}$	$D_{11} = \frac{E_\theta h_i^3}{12(1 - \nu_{\phi\theta}\nu_{\theta\phi})}$ $D_{22} = \frac{E_\phi h_i^3}{12(1 - \nu_{\phi\theta}\nu_{\theta\phi})}$	$K_{33} = G_{\phi\theta}h_i$ $D_{33} = \frac{G_{\phi\theta}h_i^3}{12}$
h_i, t, h_i Equal Face Sheets	$K_{11} = \frac{E_{\theta_1}h_i}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\theta_2}h_i}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$ $K_{22} = \frac{E_{\phi_1}h_i}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\phi_2}h_i}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$	$D_{11} = \frac{E_{\theta_1}h_i^3}{12(1-\nu_{\phi\theta_1}\nu_{\theta\phi_1})} + \frac{E_{\theta_2}h_i^3}{12(1-\nu_{\phi\theta_2}\nu_{\theta\phi_2})} + h_i\left\{\frac{E_{\theta_1}(\bar{\zeta}_{in}-\frac{h_i}{2})^2}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\theta_2}(\bar{\zeta}_{out}-\frac{h_i}{2})^2}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}\right\}$ $D_{22} = \frac{E_{\phi_1}h_i^3}{12(1-\nu_{\phi\theta_1}\nu_{\theta\phi_1})} + \frac{E_{\phi_2}h_i^3}{12(1-\nu_{\phi\theta_2}\nu_{\theta\phi_2})} + h_i\left\{\frac{E_{\phi_1}(\bar{\zeta}_{in}-\frac{h_i}{2})^2}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\phi_2}(\bar{\zeta}_{out}-\frac{h_i}{2})^2}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}\right\}$	$K_{33} = h_i(G_{\phi\theta_1} + G_{\phi\theta_2})$ $D_{33} = \frac{h_i^3}{12}(G_{\phi\theta_1} + G_{\phi\theta_2}) + h_i\left[G_{\phi\theta_1}(\bar{\zeta}_{in} - \frac{h_i}{2})^2 + G_{\phi\theta_2}(\bar{\zeta}_{out} - \frac{h_i}{2})^2\right]$
h_i, t, h_o Unequal Face Sheets	$K_{11} = \frac{E_{\theta_1}h_i}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\theta_2}h_o}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$ $K_{22} = \frac{E_{\phi_1}h_i}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\phi_2}h_o}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$	$D_{11} = \frac{E_{\theta_1}h_i^3}{12(1-\nu_{\phi\theta_1}\nu_{\theta\phi_1})} + \frac{E_{\theta_2}h_o^3}{12(1-\nu_{\phi\theta_2}\nu_{\theta\phi_2})} + \frac{E_{\theta_1}h_i(\bar{\zeta}_{in}-\frac{h_i}{2})^2}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\theta_2}h_o(\bar{\zeta}_{out}-\frac{h_o}{2})^2}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$ $D_{22} = \frac{E_{\phi_1}h_i^3}{12(1-\nu_{\phi\theta_1}\nu_{\theta\phi_1})} + \frac{E_{\phi_2}h_o^3}{12(1-\nu_{\phi\theta_2}\nu_{\theta\phi_2})} + \frac{E_{\phi_1}h_i(\bar{\zeta}_{in}-h_i/2)^2}{1-\nu_{\phi\theta_1}\nu_{\theta\phi_1}} + \frac{E_{\phi_2}h_o(\bar{\zeta}_{out}-h_o/2)^2}{1-\nu_{\phi\theta_2}\nu_{\theta\phi_2}}$	$K_{33} = G_{\phi\theta_1}h_i + G_{\phi\theta_2}h_o$ $D_{33} = \frac{G_{\phi\theta_1}h_i^3}{12} + \frac{G_{\phi\theta_2}h_o^3}{12} + G_{\phi\theta_1}h_i(\bar{\zeta}_{in}-\frac{h_i}{2})^2 + G_{\phi\theta_2}h_o(\bar{\zeta}_{out}-\frac{h_o}{2})^2$

Figure 2-10 Shell Section Properties

	Column	Format
If the Sheet Clue is EQUA (equal-size face sheet sandwich):		
A. Initial, intermediate and final values of face sheet thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
B. Initial, intermediate and final values of core thickness (t) at points defined by table of ϕ or s values.		5E14.7
If the Sheet Clue is UNEQ (unequal-size face sheet sandwich):		
A. Initial, intermediate and final values of inner face sheet thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
B. Initial, intermediate and final values of core thickness (t) at points defined by table of ϕ or s values.		5E14.7
C. Initial, intermediate and final values of outer face sheet thickness (h_o) at points defined by table of ϕ or s values.		5E14.7
If the shell is reinforced, the Sheet Clue will be BLAN. In this case it is the following, or Reinforcement Clue (item 4D) which will determine the contents of card series 6. For the reinforcement cases the geometry can be complex and varied, since all types of reinforcing are to be included. The reinforced shell input is presented below as a function of the Reinforcement Clue.		
If the Reinforcement Clue is STIl (single sheet reinforced by rings and/or stringers):		
A. Initial, intermediate and final values of the torsional stiffness in the ϕ direction (GJ_ϕ) at points defined by table of ϕ or s values.		5E14.7
B. Initial, intermediate and final values of the torsional stiffness in the θ direction (GJ_θ) at points defined by table of ϕ or s values.		5E14.7
C. Initial, intermediate and final values of stringer area (A_ϕ) at points defined by table of ϕ or s values.		5E14.7
D. Initial, intermediate and final values of ring area (A_θ) at points defined by table of ϕ or s values.		5E14.7
E. Initial, intermediate and final values of stringer eccentricity (measured inwards from base shell centroid as positive) at points defined by table of ϕ or s values.		5E14.7

	Column	Format
F. Initial, intermediate and final values of ring eccentricity (measured inwards from base shell centroid as positive) at points defined by table of ϕ or s values.		5E14.7
G. Initial, intermediate and final values of stringer moment of inertia (about base shell centroidal axis) at points defined by table of ϕ or s values.		5E14.7
H. Initial, intermediate and final values of ring moment of inertia (about base shell centroidal axis) at points defined by table of ϕ or s values.		5E14.7
I. Initial, intermediate and final values of stringer spacing at points defined by table of ϕ or s values. (Do <u>not</u> set to zero if no stringers.)		5E14.7
J. Initial, intermediate and final values of ring spacing at points defined by table of ϕ or s values. (Do <u>not</u> set to zero if no rings.)		5E14.7
K. Initial, intermediate and final values of base shell wall thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
If the Reinforcement Clue is ST12 (equal face sheet sandwich reinforced by rings and/or stringers):		
A. through J. The items contained on these cards are those described for the ST11 clue above.	10 sets of	5E14.7
K. Initial, intermediate and final values of base shell face sheet thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
L. Initial, intermediate and final values of base shell core thickness (t) at points defined by table of ϕ or s values.		5E14.7
If the Reinforcement Clue is ST13 (unequal face sheet sandwich reinforced by rings and/or stringers):		
A. through J. The items contained on these cards are those described for the ST11 clue above.	10 sets of	5E14.7
K. Initial, intermediate and final values of base shell <u>inner</u> face sheet thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
L. Initial, intermediate and final values of base shell core thickness (t) at points defined by table of ϕ or s values.		5E14.7

	Column	Format
M. Initial, intermediate and final values of base shell outer face sheet thickness (h_o) at points defined by table of ϕ or s values.		5E14.7
If the Reinforcement Clue is RWA1 (single sheet reinforced by a waffle rotated at an arbitrary angle from the meridional direction):		
A. Initial, intermediate and final values of waffle grid area at points defined by table of ϕ or s values.		5E14.7
B. Initial, intermediate and final values of waffle grid eccentricity (measured inwards from base shell centroid as positive) at points defined by table of ϕ or s values.		5E14.7
C. Initial, intermediate and final values of waffle grid moment of inertia (about base shell centroidal axis) at points defined by table of ϕ or s values.		5E14.7
D. Initial, intermediate and final values of waffle grid spacing at points defined by table of ϕ or s values.		5E14.7
E. Initial, intermediate and final values of waffle grid rotation angle, β, (in radians from the meridional direction) at points defined by table of ϕ or s values.		5E14.7
F. Initial, intermediate and final values of base shell wall thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
If the Reinforcing Clue is RWA2 (equal face sheet sandwich reinforced by a waffle rotated at an arbitrary angle from the meridional direction):		
A. through E. The items contained on these cards are those described for the RWA1 clue above.	5 sets of	5E14.7
F. and G. The items contained on these cards are those described for the ST12 clue above as items K. and L.	2 sets of	5E14.7
If the Reinforcing Clue is RWA3 (unequal face sheet sandwich reinforced by a waffle rotated at an arbitrary angle from the meridional direction):		
A. through E. The items contained on these cards are those described for the RWA1 clue above.	5 sets of	5E14.7
F. through H. The items contained on these cards are those described for the ST13 clue above as items K. through M.	3 sets of	5E14.7

	Column	Format
If the Reinforcing Clue is ISG1 (single sheet reinforced by a general angle isogrid construction):		
A. through D. The items contained on these cards are identical to those described for the RWA1 clue above, but with reference to the isogrid.	4 sets of	5E14.7
E. Initial, intermediate and final values of the isogrid angle, β, (in radians from the meridional direction, see Reference 6 Appendix A). For the normal isogrid, the angle is 30° (input in radians).		5E14.7
F. Initial, intermediate and final values of base shell wall thickness (h_i) at points defined by table of ϕ or s values.		5E14.7
If the Reinforcing Clue is ISG2 (equal face sheet sandwich reinforced by a general angle isogrid construction):		
A. through E. The items contained on these cards are those described for the ISG1 clue above.	5 sets of	5E14.7
F. and G. The items contained on these cards are those described for the ST12 clue above as items K. and L.	2 sets of	5E14.7
If the Reinforcing Clue is ISG3 (unequal face sheet sandwich reinforced by a general angle isogrid construction):		
A. through E. The items contained on these cards are those described for the ISG1 clue above.	5 sets of	5E14.7
F. through H. The items contained on these cards are those described for the ST13 clue above as items K. through M.	3 sets of	5E14.7

If the Reinforcing Clue is ST10 the following Hooke's Laws will be used by the program for the description of the shell wall:

$$N_\theta = K_{11}\varepsilon_{\theta_o} + K_{12}\varepsilon_{\phi_o} - C_{11}k_\theta - N_{T\theta}$$

$$N_\phi = K_{22}\varepsilon_{\phi_o} + K_{12}\varepsilon_{\theta_o} - C_{22}k_\phi - N_{T\phi}$$

$$N_{\phi\theta} = N_{\theta\phi} = K_{33}\gamma_{\phi\theta_o}$$

	Column	Format

$$M_\theta = D_{11}k_\theta + D_{12}k_\phi + C_{11}\varepsilon_{\theta_o} - M_{T\theta}$$

$$M_\phi = D_{22}k_\phi + D_{12}k_\theta + C_{22}\varepsilon_{\phi_o} - M_{T\phi}$$

$$M_{\phi\theta} = -M_{\theta\phi} = -2D_{33}k_{\phi\theta}$$

Therefore the input is (see Ref. 6 Appendix A):

A. Initial, intermediate and final values of K_{11} at points defined by table of ϕ or s values. — 5E14.7

B. Initial, intermediate and final values of K_{12} at points defined by table of ϕ or s values. — 5E14.7

C. Initial, intermediate and final values of K_{22} at points defined by table of ϕ or s values. — 5E14.7

D. Initial, intermediate and final values of K_{33} at points defined by table of ϕ or s values. — 5E14.7

E. Initial, intermediate and final values of D_{11} at points defined by table of ϕ or s values. (Should be input as <u>negative</u> for sign convention.) — 5E14.7

F. Initial, intermediate and final values of D_{12} at points defined by table of ϕ or s values. (Should be input as <u>negative</u> for sign convention.) — 5E14.7

G. Initial, intermediate and final values of D_{22} at points defined by table of ϕ or s values. (Should be input as <u>negative</u> for sign convention.) — 5E14.7

H. Initial, intermediate and final values of D_{33} at points defined by table of ϕ or s values. — 5E14.7

I. Initial, intermediate and final values of C_{11} at points defined by table of ϕ or s values. — 5E14.7

J. Initial, intermediate and final values of C_{22} at points defined by table of ϕ or s values. — 5E14.7

If the Reinforcing Clue is RWAF the following Hooke's Laws will be used by the program for the description of the shell wall:

$$N_\theta = K_{11}\,\varepsilon_{\theta_o} + K_{12}\,\varepsilon_{\phi_o} - C_{11}\,k_\theta - C_{15}\,k_\phi - N_{T\theta}$$

$$N_\phi = K_{22}\,\varepsilon_{\phi_o} + K_{12}\,\varepsilon_{\theta_o} - C_{15}\,k_\theta - C_{22}\,k_\phi - N_{T\phi}$$

$$N_{\phi\theta} = K_{33}\,\gamma_{\phi\theta_o} - 2C_{16}\,k_{\phi\theta}$$

$$M_\theta = D_{11} k_\theta + D_{12} k_\phi + C_{11} \varepsilon_{\theta_o} + C_{15} \varepsilon_{\phi_o} - M_{T\theta}$$

$$M_\phi = D_{22} k_\phi + D_{12} k_\theta + C_{15} \varepsilon_{\theta_o} + C_{22} \varepsilon_{\phi_o} - M_{T\phi}$$

$$M_{\phi\theta} = -2D_{33} k_{\phi\theta} + C_{16} \gamma_{\phi\theta_o}$$

	Column	Format
Therefore the input is (see Ref. 6 Appendix A):		
A. through J. The items contained on these cards are those described for the ST10 clue above.	10 sets of	5E14.7
K. Initial, intermediate and final values of C_{15} at points defined by table of ϕ or s values.		5E14.7
L. Initial, intermediate and final values of C_{16} at points defined by table of ϕ or s values.		5E14.7

7. Loading Clue Card (For first harmonic only in a multi-harmonic submission)

The contents of this card are numerical clues which alert the program to the types of loads that exist on the segment. In addition, if the clue indicates that some load does not exist, the appropriate cards in series 8 which would ordinarily contain the numerical values of this load are omitted from the sequence.

The series of cards 7 and 8 are repeated for the number of loading conditions indicated on the Program Control Card (item E) up to a maximum of 10. If for one of these loading conditions, no load exists on the segment, then a blank Loading Clue Card is inserted in the sequence at this point and the load cards are entirely omitted. For instance if there are four load patterns to be investigated, and for the second pattern some segment is completely unloaded, the card sequence for that segment would be:

Loading Clue Card for pattern one (card 7)
Load Values for pattern one (card 8)
Blank Card
Loading Clue Card for pattern three (card 7)
Load Values for pattern three (card 8)
Loading Clue Card for pattern four (card 7)
Load Values for pattern four (card 8)

	Column	Format
The appropriate clues are as follows:		
A. Thermal Clue If there are no thermal loads (Item 4E is NOTH) the clue number is zero (0). If there is a standard thermal variation through the thickness (Item 4E is THST) the clue number is four (4). If the temperature is constant through the thickness (Item 4E is THCN) or if the inhomogeneous option is used (Item 4E is THIN) the clue number is one (1). If a thermal loading does exist on the structure, then the stiffnesses matrix is thermal dependent. In this case successive mechanical load conditions will all be superimposed on the hot structure as discussed previously.	1	I1
B. Circumferential Load Clue (f_θ) If there are no circumferential loads, then the clue number is zero (0). If there are circumferential loads, then the clue number is one (1).	2	I1
C. Meridional Load Clue (f_ϕ) If there are no meridional loads, then the clue number is zero (0). If there are meridional loads, then the clue number is one (1).	3	I1
D. Normal Load Clue (f_ζ) If there are no normal loads, then the clue number is zero (0). If there are normal loads, then the clue number is one (1).	4	I1
E. Circumferential Moment Load Clue (m_θ) If there are no circumferential moment loads, then the clue number is zero (0). If there are circumferential moment loads, then the clue number is one (1).	5	I1

	Column	Format
F. Meridional Moment Load Clue (m_ϕ) If there are no meridional moment loads, then the clue number is zero (0). If there are meridional moment loads, then the clue number is one (1).	6	I1
G. Any alphameric information (load description)	7-70	16A4

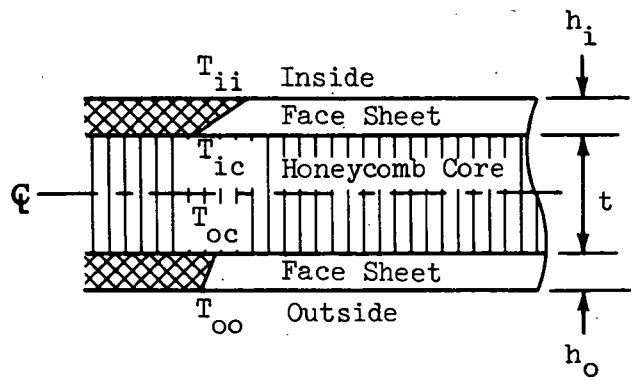
8. Table of Applied Loads (see Figures 2-11a, b for sign convention). Loads are for the initial harmonic only if the submission is multi-harmonic.

The appropriate card sequence is given below as a function of the Loading Clues on card 7. If the Thermal Clue is one (1):

A. Initial, intermediate and final values of the temperature of the shell at points defined by table of ϕ or s values. (These values will be used either for a thermal problem where there is no thermal variation through the thickness {Clue = THCN}, or to calculate varying material properties along the shell for an inhomogeneous problem {Clue = THIN}.)	5E14.7

If the Thermal Clue is four (4):

A. Initial, intermediate and final values of the temperature T_{ij} at points defined by table of ϕ or s values. (The subscripts "nm" indicate temperature location - see below.)	5E14.7



	Column	Format
B. Initial, intermediate and final values of the temperature T_{ic} at points defined by table of ϕ or s values.		5E14.7
C. Initial, intermediate and final values of the temperature T_{oc} at points defined by table of ϕ or s values.		5E14.7
D. Initial, intermediate and final values of the temperature T_{oo} at points defined by table of ϕ or s values.		5E14.7

If the Thermal Clue is zero (0), the above cards are omitted.

If the Circumferential Load Clue is one (1):

E. Initial, intermediate and final values of the circumferential loads f_θ at points defined by table of ϕ or s values. — 5E14.7

For a discussion of distributed loads see Reference 4, Appendix A.

If the Circumferential Load Clue is zero (0), cards E are omitted.

If the Meridional Load Clue is one (1):

F. Initial, intermediate and final values of the meridional loads f_ϕ at points defined by table of ϕ or s values. — 5E14.7

If the Meridional Load Clue is zero (0), cards F are omitted.

If the Normal Load Clue is one (1):

G. Initial, intermediate and final values of the normal loads f_ζ at points defined by table of ϕ or s values. — 5E14.7

If the Normal Load Clue is zero (0), cards G are omitted.

If the Circumferential Moment Load Clue is one (1):

H. Initial, intermediate and final values of the circumferential moment loads m_θ at points defined by table of ϕ or s values. — 5E14.7

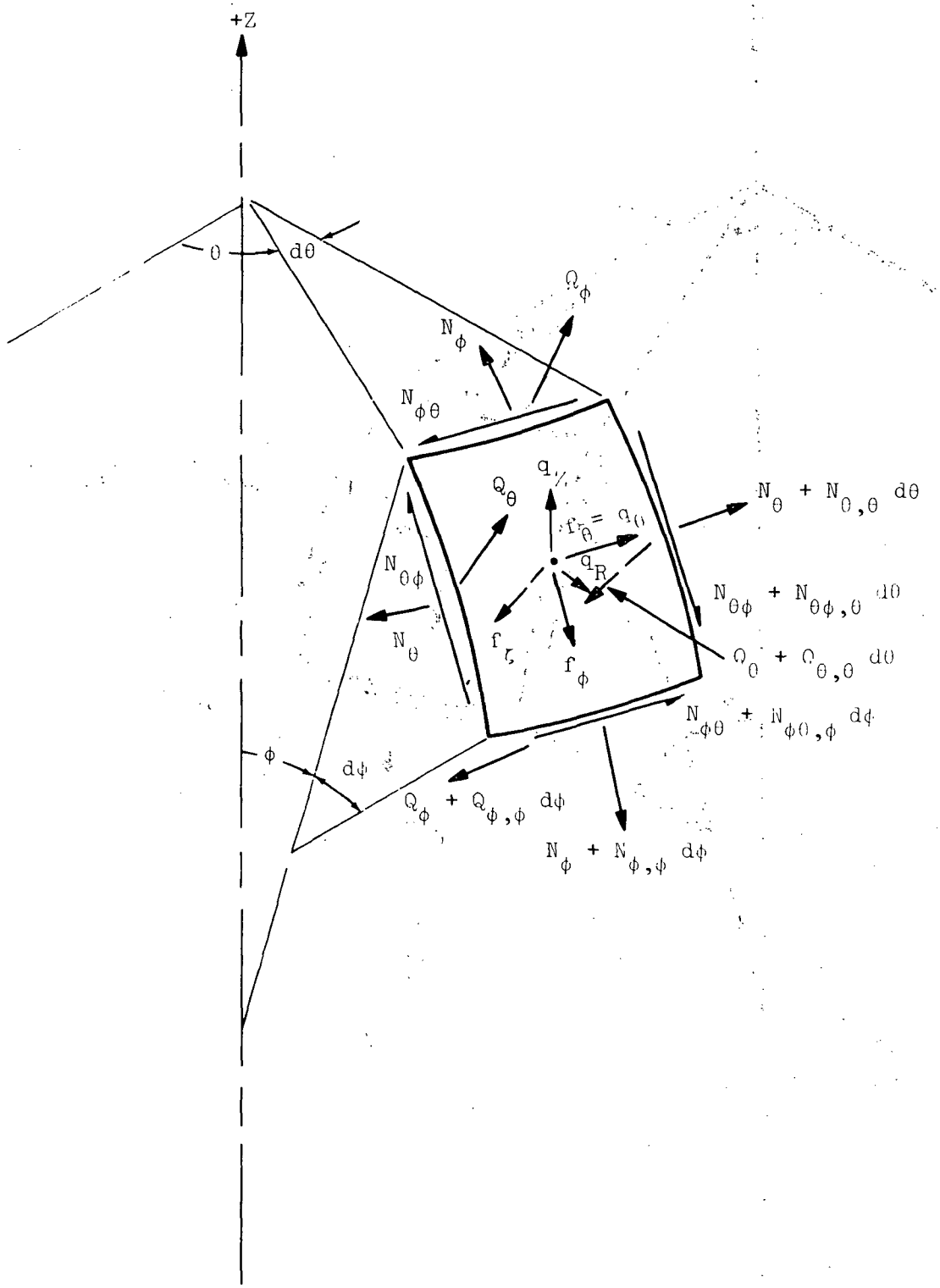


Figure 2-11a. Forces on Shell Element

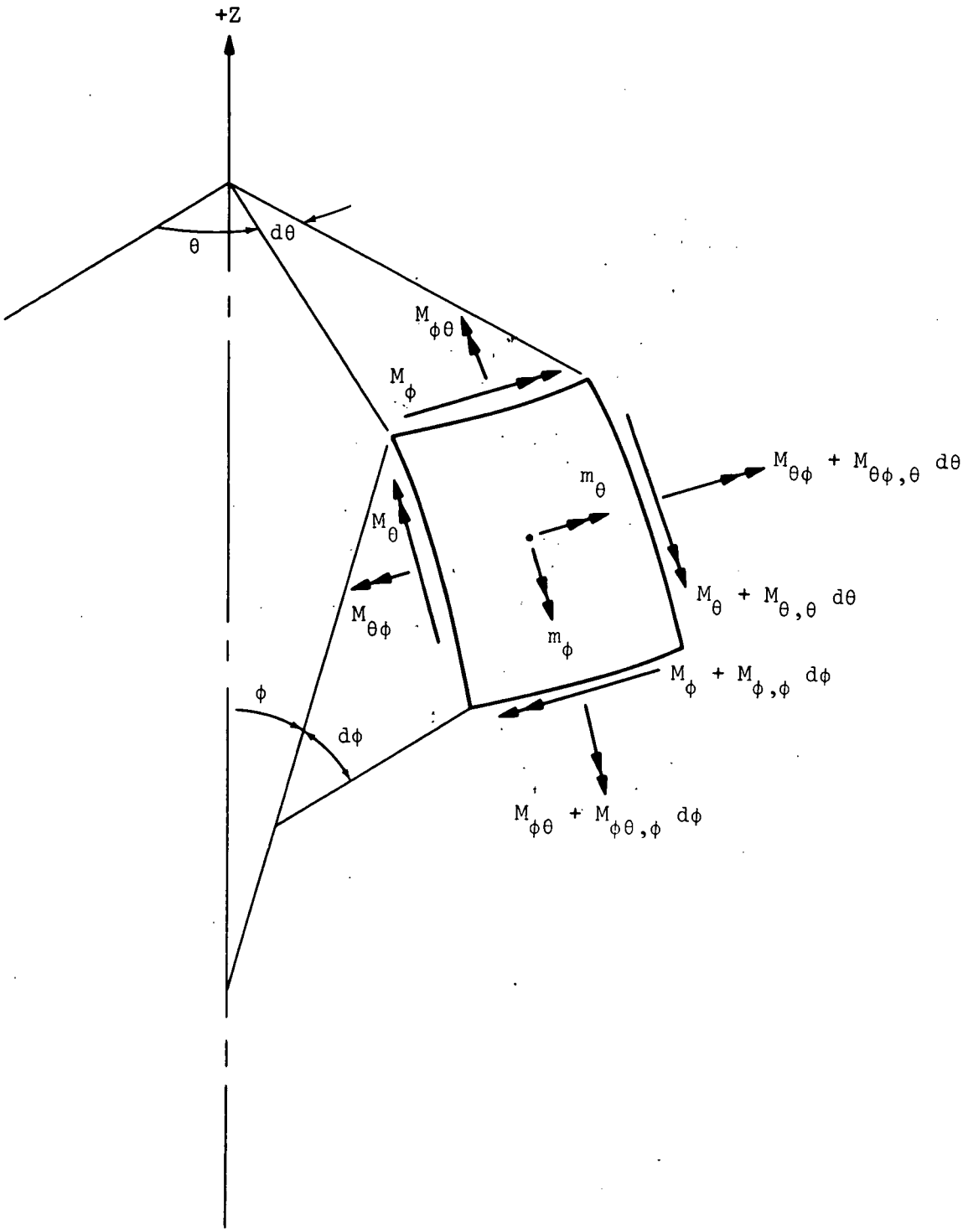


Figure 2-11b. Moments on Shell Element

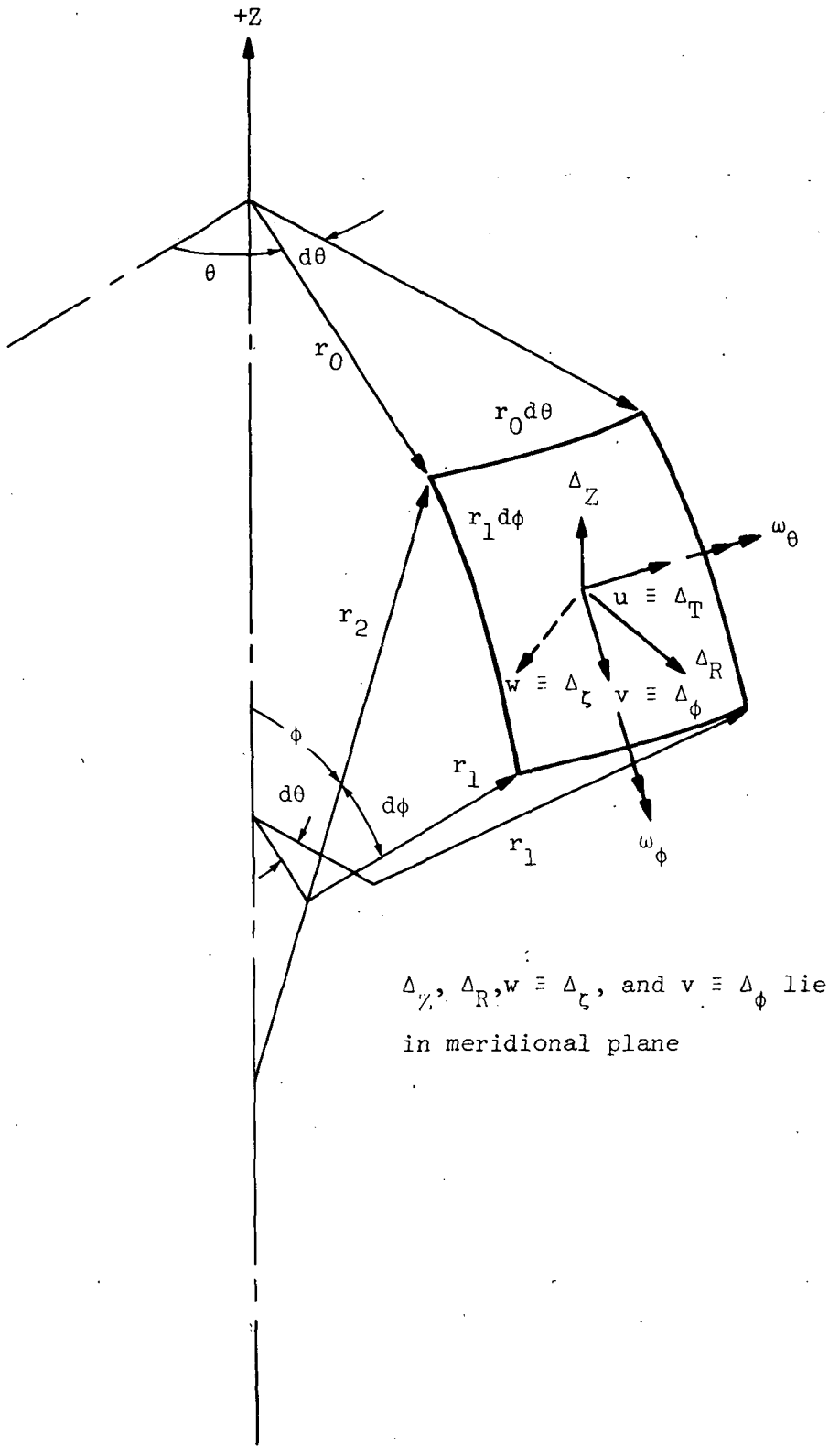


Figure 2-11c. Shell Element Geometry and Displacements

	Column	Format
If the Circumferential Moment Load Clue is zero (0), cards H are omitted.		
If the Meridional Moment Load Clue is one (1):		
I. Initial, intermediate and final values of the meridional moment loads m_ϕ at points defined by table of ϕ or s values.		5E14.7
If the Meridional Moment Load Clue is zero (0), cards I are omitted.		
9. Table of assumed Meridional Membrane Force $\overline{N}_\phi$ for axisymmetric, single harmonic, non-linear problems.		
If item 4G on the Master Clue Card is NPHI:		
A. Initial intermediate and final values of $\overline{N}_\phi$ at points defined by table of ϕ or s values.		5E14.7
If Item 4G on the Master Clue Card is LINE, card sequence 9 is omitted. If the problem under consideration is non-linear, then the stiffness matrix depends upon $\overline{N}_\phi$ and only one load condition may be run. In addition the problem may not be multi-harmonic. (See Program Control Card.)		

Non-Linear Analysis

The present STARS-2S shell program is capable of considering non-linear effects, but under restricted conditions. The only non-linear behavior that can be currently analyzed is that due to axisymmetric loading, and the only mode of deformation that is considered under this loading is the axisymmetric mode. The iteration technique which is not automated, can be accidentally made to diverge. To ensure convergence, care must be taken to satisfy the segment sizing parameters. A non-linear analysis would then use the following steps:

1) The first approximation to N is obtained from a linear solution, which may yield larger results than the actual non-linear final value.

2) After the preliminary values are obtained, the structure segments should be resized in the areas where local non-linear behavior is suspected, using the non-linear sizing parameter (γ) described on pages 2-31 to 2-33.

3) If non-linear effects are locally large, the value for $\overline{N}$ obtained from a linear solution (step 1) may dominate the loading terms in a non-linear analysis, and cause oscillations. To eliminate this possibility, the first $\overline{N}$ approximation should be lower than the value predicted by a linear analysis (90 to 50 percent depending on the suspected magnitude of non-linearity). If oscillations are encountered at any stage, they can be eliminated, and a trend toward convergence reestablished by using smaller values of $\overline{N}$.

4) With this step the procedure is repeated. A non-linear analysis is made and the N output is compared with the barred (assumed) quantities. This procedure is carried out until convergence is reached. For the magnitude of non-linearities considered by the present theory about 2 iterations are usually sufficient.

	Column	Format

10. Stress Clue Card

This card contains a series of clues which are used to identify the proper Hooke's Law to be used for stress calculations. If the Reinforcing Clue (Item 4D) is THIC, ST10, or RWAF, the sets of cards 10 and 11 are omitted.

A.	Meridional Stress Inner Edge Clue This clue informs the program as to what kind of construction exists at the meridional inner edge of the shell segment. If the construction is part of the basic shell, the clue is: SHEL. If the construction is part of the rotated waffle reinforcement, the clue is: WAFF. If the construction is part of a stringer, the clue is: STRI. If the construction is part of the isogrid, the clue is: ISGR.	1-4	A4
B.	Meridional Stress Outer Edge Clue This clue informs the program as to what kind of construction exists at the meridional outer edge of the shell segment. The same possibilities as in Item A exist, and the possible clues again are: SHEL WAFF STRI ISGR	11-14	A4

	Column	Format
C. Hoop Stress Inner Edge Clue	21-24	A4

This clue informs the program as to what kind of construction exists at the hoop inner edge of the shell segment. If the construction is part of the basic shell, the clue is: SHEL. If the construction is part of the rotated waffle reinforcement, the clue is: WAFF. If the construction is part of a ring, the clue is: RING. If the construction is part of the isogrid, the clue is: ISGR.

D. Hoop Stress Outer Edge Clue	31-34	A4

This clue informs the program as to what kind of construction exists at the hoop outer edge of the shell segment. The same possibilities as in Item C exist, and the possible clues again are:

SHEL
WAFF
RING
ISGR

11. Reinforced Stress Calculation Table

The contents of these cards are dependent upon the Reinforcing Clue (Item 4D). If this clue is THIC, ST10, or RWAF, the sets of cards 10 and 11 are omitted.

If the Reinforcing Clue is RWA1, RWA2, RWA3, ISG1, ISG2, or ISG3:

A. Initial, intermediate and final values of extreme inward distance to reinforcement edge at points defined by ϕ or s table. This is a signed ($\pm$) value, measured from the base shell centroid to the extreme point of shell or reinforcement, positive inwards.	5E14.7
B. Initial, intermediate and final values of extreme outward distance to reinforcement edge at points defined by ϕ or s table. This is a signed ($\pm$) value, measured from the base shell centroid to the extreme point of shell or reinforcement, positive inwards.	5E14.7

	Column	Format
If the Reinforcing Clue is ST11, ST12, or ST13:		
A. Initial, intermediate and final values of extreme inward distance on θ side to reinforcement edge at points defined by ϕ or s table. This is a signed (±) value, measured from the base shell centroid to the extreme point of shell or ring, positive inwards.		5E14.7
B. Initial, intermediate and final values of extreme outward distance on θ side to reinforcement edge at points defined by ϕ or s table. This is a signed (±) value, measured from the base shell centroid to the extreme point of shell or ring, positive inwards.		5E14.7
C. Initial, intermediate and final values of extreme inward distance on φ side to reinforcement edge at points defined by ϕ or s table. This is a signed (±) value, measured from the base shell centroid to the extreme point of shell or stringer, positive inwards.		5E14.7
D. Initial, intermediate and final values of extreme outward distance on φ side to reinforcement edge at points defined by ϕ or s table. This is a signed (±) value, measured from the base shell centroid to the extreme point of shell or stringer, positive inwards.		5E14.7
12. Segment Topology Cards		
A. Segment number Number of the segment under consideration.	1-5	I5
B. Joint (i) Joint associated with i^{th} end of the segment (TIC).	6-10	I5
C. Joint (j) Joint associated with the j^{th} end of the segment (STOP). Since within a region the segments are all singly connected, the segment joint numbers should be in adjacent numerical pairs. That is, if joint (j) is 6, joint (i) could only be 5 or 7. This is true only within a region.	11-15	I5

	Column	Format
In addition, the initial joint of each region must be 1 in segment topology numbering, and the final joint of each region must be the last (highest) number in the segment topology numbering (see Figure 2-12). The coordinate ϕ or s increases from TIC to STOP, i to j. The user is again advised to see Figures 2-3 to 2-9.		
D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging)	minus in 1-80	

INTRA-REGION DISCRETE RING CARDS

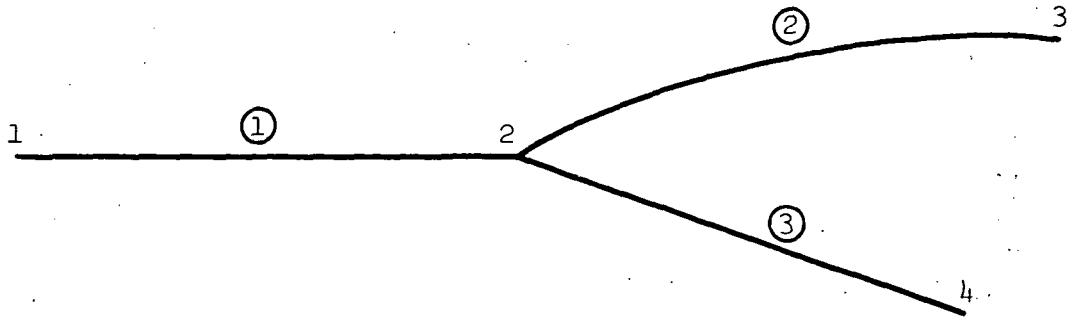
These cards, if any exist (region introductory card, item 1C), are placed at the end of all the segment data for the region. They contain the following information for each ring (in groups of 3 cards):

1. Ring Location and Property Card

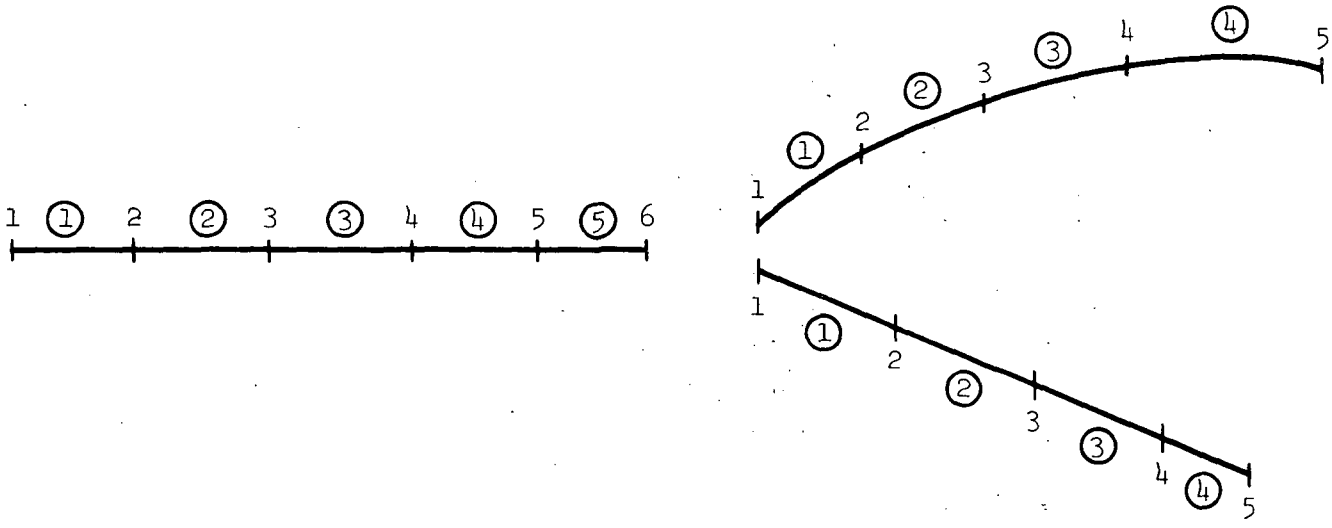
		Column	Format
A.	Segment joint number to which the ring is attached. If there is also a radial discontinuity at this location necessitating a kinematic link, the joint number of the ring is the independent joint number of the link (see Figure 2-13a).	1-2	I2
B.	Ring extensional stiffness (EA)	3-16	E14.7
C.	Ring bending stiffness about centroidal y axis (EI_y). See Figure 2-14.	17-30	E14.7
D.	Ring cross-bending stiffness about centroidal axes (EI_{xy}).	31-44	E14.7
E.	Ring torsional stiffness (GJ)	45-58	E14.7
F.	Ring bending stiffness about centroidal x axis (EI_x).	59-72	E14.7

2. Ring Geometry Card (see Figure 2-14)

A.	Ring thermal coefficient of expansion (α_R).	1-12	E12.5
B.	Ring centroidal radius (r_c).	13-24	E12.5

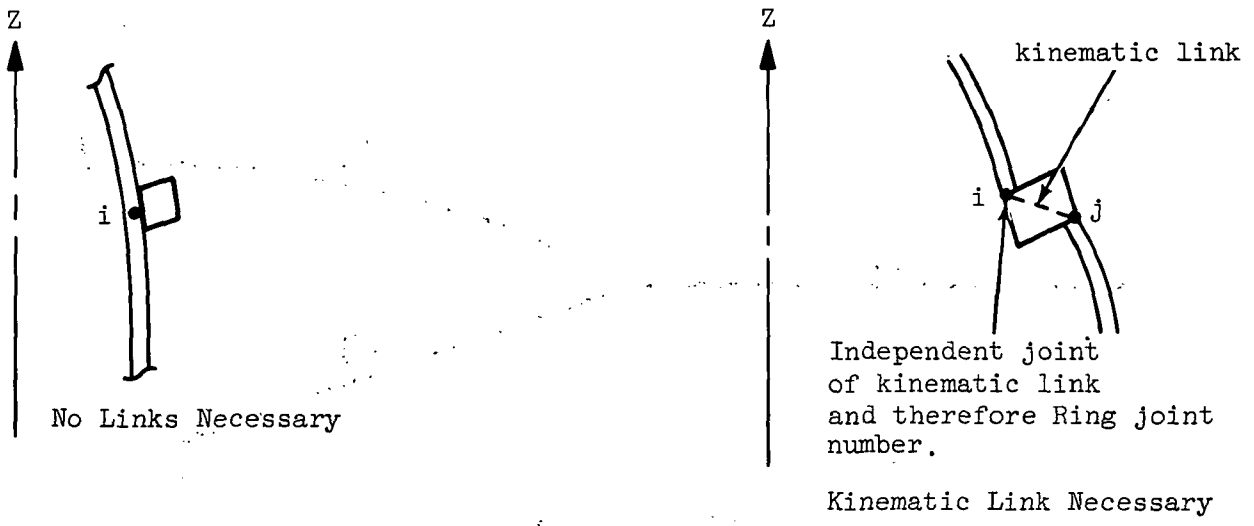


Region Numbering

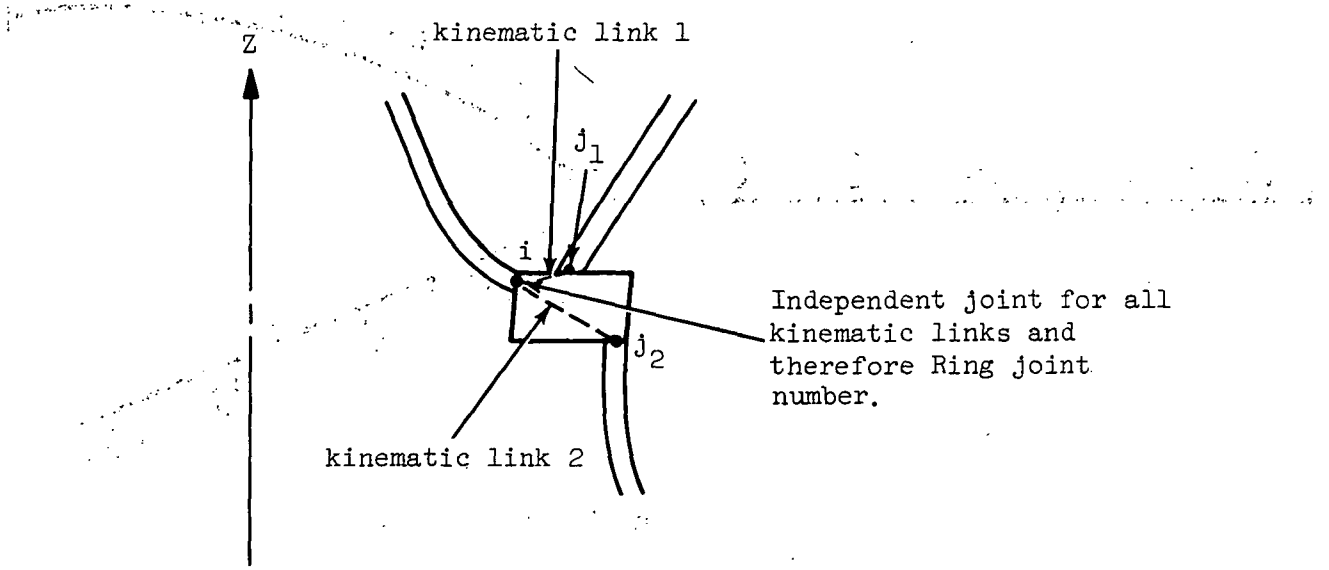


Numbering of Segments Within Regions

Figure 2-12. Topology Schemes



(a) Segment or Simple Region Rings



(b) Possible Region Multi-connected Rings

Figure 2-13. Discrete Ring Topology

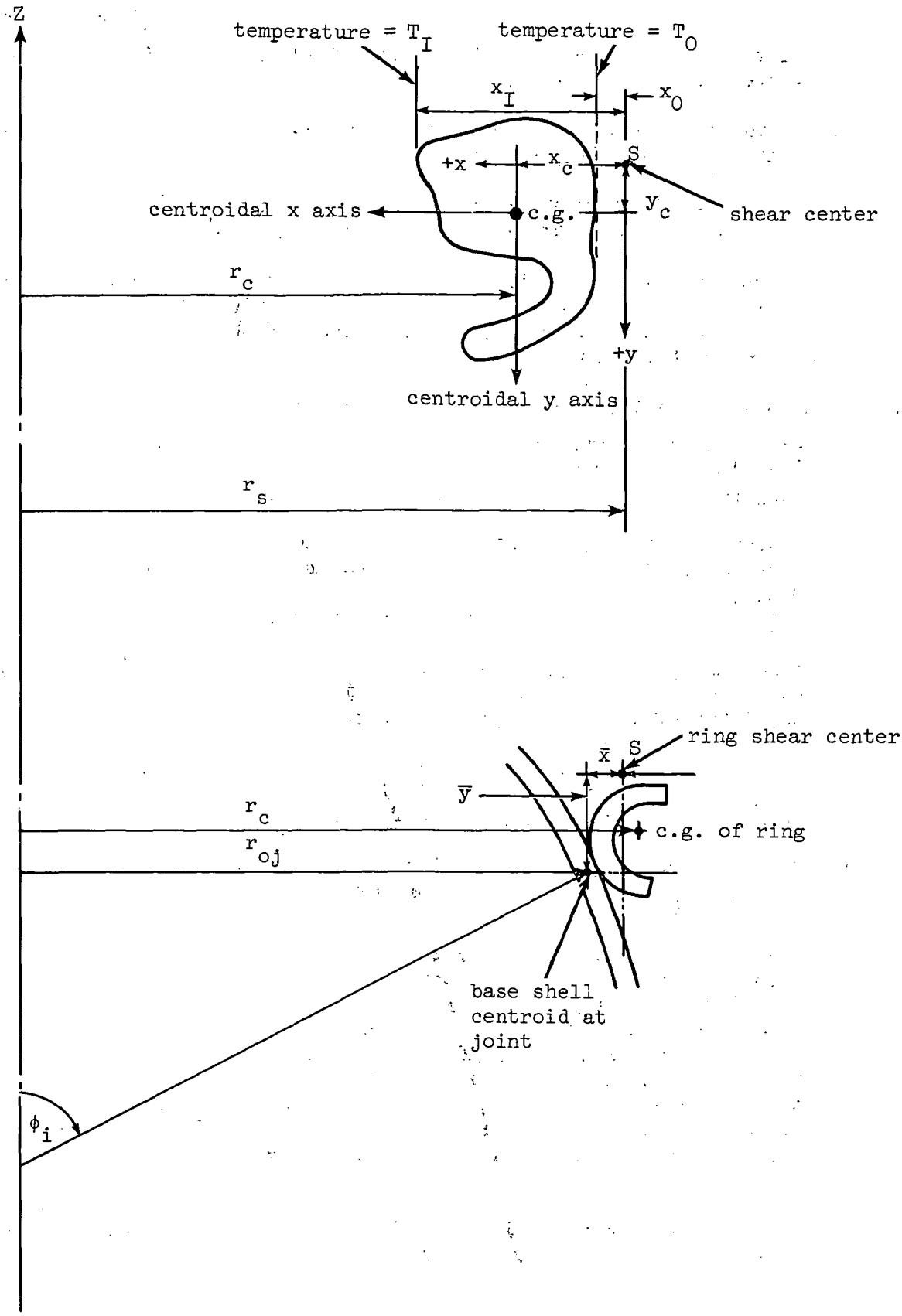


Figure 2-14. Discrete Ring Geometry

		Column	Format
C.	Distance (±) between ring centroid and shear center in the x direction (x_c).	25-36	E12.5
D.	Distance (±) between ring centroid and shear center in the y direction (y_c).	37-48	E12.5
E.	Offset (±) of ring shear center from attached shell joint (see item 1A) in the x direction ($\bar{x}$).	49-60	E12.5
F.	Offset (±) of ring shear center from attached shell joint (see item 1A) in the y direction ($\bar{y}$). Note: The shear center (S) is the origin of the x, y axes shown in Figure 2-14.	61-72	E12.5

3. Ring Thermal Description Card (See Figure 2-14)

A.	Distance (±) between ring shear center and the closest (innermost) radially measured ring point x_I (in x = radial direction).	1-14	E14.7
B.	Distance (±) between ring shear center and the farthest (outermost) radially measured ring point, x_O (in x = radial direction). Note: Items A & B cannot both be input as zero.	15-28	E14.7
C.	Innermost point temperature (T_I). Note: For a harmonic $n \neq 0.0$ this is the amplitude of a cosine expansion $T_I \cos n\theta$.	29-42	E14.7
D.	Outermost point temperature (T_O). Note: For a harmonic $n \neq 0.0$ this is the amplitude of a cosine expansion $T_O \cos n\theta$.	43-56	E14.7
E.	Ring stress-free temperature (room or manufacturing temperature (see Note for Master Clue Card item F).	57-70	E14.7

The number of sets of discrete ring cards must be equal the number specified in item 1C, of the region introductory card.
Note: Thermal loads on the rings are input on the above cards. Mechanical loads on the ring must be input as a load distribution on the segments connecting to the ring. A higher intensity loading may be distributed near the segment ends connected to the ring.

D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging) — minus in 1-80

	Column	Format

INTRA-REGION KINEMATIC LINK CARDS

These cards, if any exist (region introductory card, item 1B), are placed at the end of all the discrete ring data for the region. They contain the following information:

A.	Joint (j) dependent joint	1-2	I2
B.	Joint (i) independent joint For intra-region kinematic links these joints must be in consecutive decending order. That is, joint (j) should always be greater than joint (i) by one.	3-4	I2
C.	Angle γ in radians (see Figure 2-15) γ cannot equal 0 or π. The angle γ describes the orientation of the link; it is the inclination angle of the link from the vertical (Z axis). The number of kinematic link cards must equal the number specified in item 1B, of the region introductory card.	5-19	E14.7

D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging) — minus in 1-80

REGION JOINT CONTROL DATA

These cards are placed at the end of all the data for all regions.

1. Joint Control Data Card

A.	Number of region joints Total number of region joints (Max. = 20).	1-5	I5
B.	Number of discrete rings Total number of discrete rings between regions.	6-10	I5
C.	Number of kinematic links Total number of kinematic links between regions.	11-15	I5

		Column	Format
2.	Discrete Ring Cards (inter-region, if any exist)		
	A. Ring Location and Property Card		
	a. Region joint number to which the ring is attached. If there are also radial discontinuities at this location necessitating kinematic links, or multi-connections, the joint number of the ring is the <u>independent</u> joint number of all the links (see Figure 2-13b).	1-2	I2
	b. Ring extensional stiffness (EA)	3-16	E14.7
	c. Ring bending stiffness about centroidal y axis (EI_y). See Figure 2-14.	17-30	E14.7
	d. Ring cross-bending stiffness about centroidal axes (EI_{xy}).	31-44	E14.7
	e. Ring torsional stiffness (GJ)	45-58	E14.7
	f. Ring bending stiffness about centroidal x axis (EI_x).	59-72	E14.7
	B. Ring Geometry Card (see Figure 2-14)		
	a. Ring thermal coefficient of expansion (α_R).	1-12	E12.5
	b. Ring centroidal radius (r_c).	13-24	E12.5
	c. Distance (±) between ring centroid and shear center in the x direction (x_c).	25-36	E12.5
	d. Distance (±) between ring centroid and shear center in the y direction (y_c).	37-48	E12.5
	e. Offset (±) of ring shear center from attached shell joint (see item Aa) in the x direction ($\bar{x}$).	49-60	E12.5
	f. Offset (±) of ring shear center from shell joint (see item Aa) in the y direction ($\bar{y}$).	61-72	E12.5
	<u>Note</u>: The shear center (S) is the origin of the x,y axes shown in Figure 2-14.		

		Column	Format
C.	Ring Thermal Description Card (See Figure 2-14)		
	a. Distance (±) between ring shear center and the closest (innermost) radially measured ring point, x_I (in x = radial direction).	1-14	E14.7
	b. Distance (±) between ring shear center and the farthest (outermost) radially measured ring point, x_O (in x = radial direction). Note: Items a & b cannot both be input as zero.	15-28	E14.7
	c. Innermost point temperature (T_I). Note: For a harmonic n ≠ 0.0 this is the amplitude of a cosine expansion $T_I \cos n\theta$.	29-42	E14.7
	d. Outermost point temperature (T_O). Note: For a harmonic n ≠ 0.0 this is the amplitude of a cosine expansion $T_O \cos n\theta$.	43-56	E14.7
	e. Ring stress-free temperature (room or manufacturing temperature (see Note for Master Card item F).	57-70	E14.7
	The number of sets of discrete ring cards must equal the number specified in item 1B, of the Joint Control Data Card. Note: Thermal loads on the ring are input on the above cards. Mechanical loads on the ring must be input as line loads or moments on the shell joint (item Aa) assigned to the ring.		
	D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging)	minus in	1-80
3.	Kinematic Link Cards (inter-region, if any exist)		
	A. Joint (j) dependent joint	1-2	I2
	B. Joint (i) independent joint	3-4	I2
	For kinematic links between regions there are no restrictions upon joint numbering.		

		Column	Format

The only restriction is that between successive kinematic link data cards the (j) joint entry should be in increasing order (not necessarily consecutive). For example:

	j	i	γ
Must be in increasing order.	3	2	—
	4	2	—
	9	1	—
	12	6	—

C. Angle γ in radians (see Figure 2-15) — 5-19 — E14.7

γ cannot equal 0 or π.

The angle γ describes the orientation of the link; it is the inclination angle of the link from the vertical (Z axis). The number of kinematic link cards must equal the number specified in item 1C of the joint Control Data Card.

D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D — minus in 1-80
(See General Notes - Data Debugging)

4. Boundary Condition Cards (Joint Data - one card per region joint)

A. Joint Number — 1-2 — I2

B. Joint component conditions on:

1) Δ_T — 3-4 — F2.0

2) Δ_Z or Δ_N (see Figure 2-16) — 5-6 — F2.0

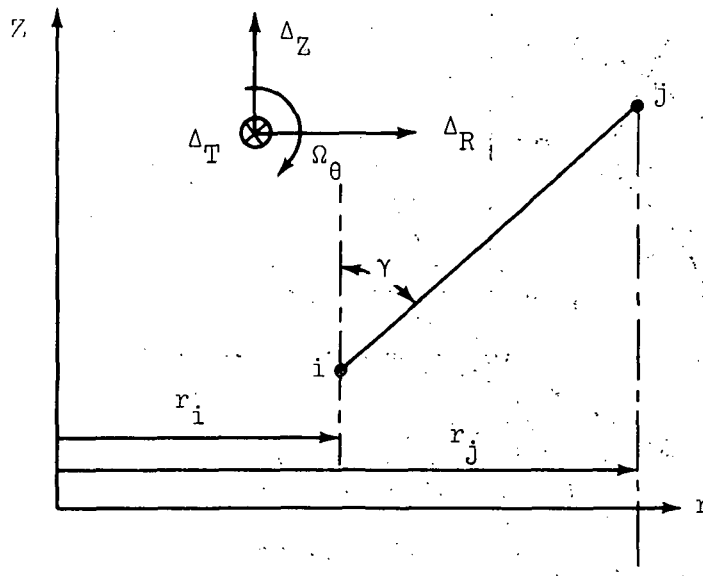
3) Δ_R or Δ_Q — 7-8 — F2.0

4) Ω_θ — 9-10 — F2.0

C. Angle α in radians — 11-24 — E14.1

To be used only in conjunction with a 2 or 3 code.

Note: There must be as many boundary condition cards as there are joints as indicated in item 1A of the Joint Control Data Card.



$$\begin{Bmatrix} \Delta_{T_j} \\ \Delta_{Z_j} \\ \Delta_{R_j} \\ \Omega_{\theta_j} \end{Bmatrix} = \left[\begin{array}{c|c|c|c} \frac{r_j}{r_i} & 0 & 0 & 0 \\ \hline 0 & +1 & 0 & -(r_j - r_i) \\ \hline 0 & 0 & +1 & (r_j - r_i)\cot\gamma \\ \hline 0 & 0 & 0 & +1 \end{array}\right] \begin{Bmatrix} \Delta_{T_i} \\ \Delta_{Z_i} \\ \Delta_{R_i} \\ \Omega_{\theta_i} \end{Bmatrix}$$

Figure 2-15. Kinematic Link

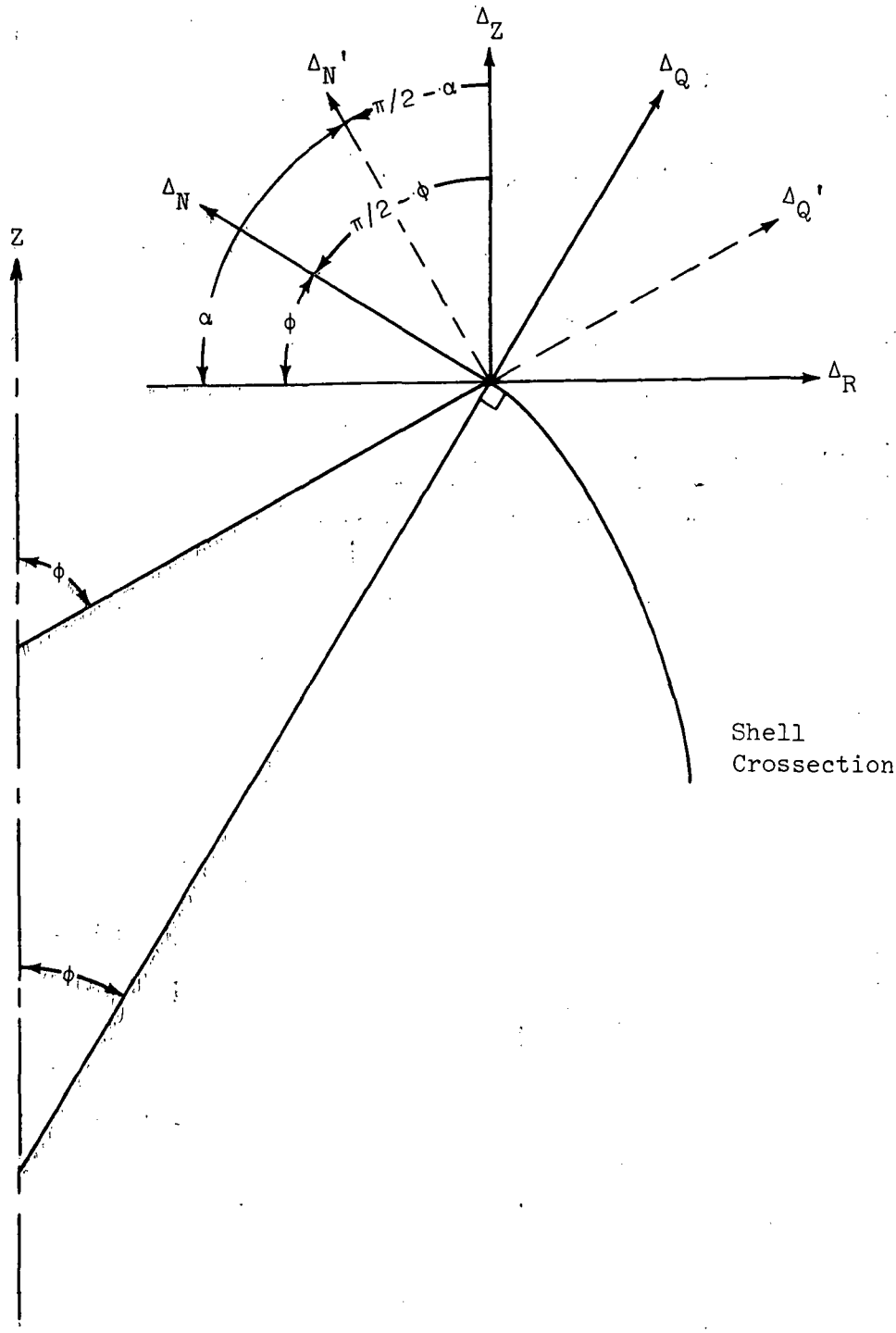
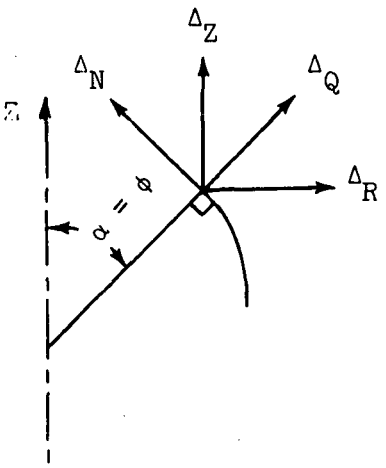
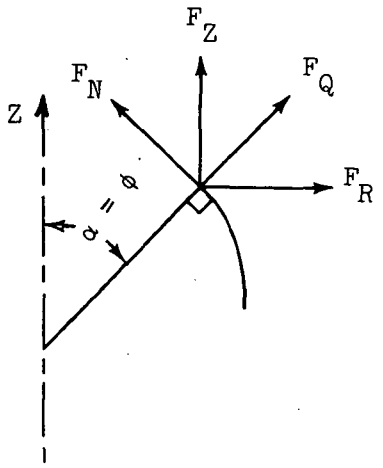


Figure 2-16a. Description of General Coordinate Rotation ($\alpha \neq \phi$)





Rotation Code 1 2 3 1

Matrix

$$\begin{Bmatrix} \Delta_T \\ \Delta_Z \\ \Delta_R \\ \Omega_\theta \end{Bmatrix} = \left[\begin{array}{c|c|c|c} +1 & 0 & 0 & 0 \\ 0 & \sin\alpha & \cos\alpha & 0 \\ 0 & -\cos\alpha & \sin\alpha & 0 \\ 0 & 0 & 0 & +1 \end{array}\right] \begin{Bmatrix} \Delta_T \\ \Delta_N \\ \Delta_Q \\ \Omega_\theta \end{Bmatrix}$$

Rotation Code 1 2 0 1

Matrix

$$\begin{Bmatrix} \Delta_T \\ \Delta_Z \\ \Delta_R \\ \Omega_\theta \end{Bmatrix} = \left[\begin{array}{c|c|c} +1 & 0 & 0 \\ 0 & \sin\alpha & 0 \\ 0 & -\cos\alpha & 0 \\ 0 & 0 & +1 \end{array}\right] \begin{Bmatrix} \Delta_T \\ \Delta_N \\ \Omega_\theta \end{Bmatrix}$$

Rotation Code 1 0 3 1

Matrix

$$\begin{Bmatrix} \Delta_T \\ \Delta_Z \\ \Delta_R \\ \Omega_\theta \end{Bmatrix} = \left[\begin{array}{c|c|c} +1 & 0 & 0 \\ 0 & \cos\alpha & 0 \\ 0 & \sin\alpha & 0 \\ 0 & 0 & +1 \end{array}\right] \begin{Bmatrix} \Delta_T \\ \Delta_Q \\ \Omega_\theta \end{Bmatrix}$$

Figure 2-16b. Provision for Local Rotations

There are 4 different codes that are used to prescribe joint component conditions. They are:

a. 0 = no displacement allowed.

b. 1 = displacement allowed in the indicated direction.

c. 2 = Δ_Z and Δ_R are rotated through an angle of $(\pi/2 - \alpha)$ and become Δ_N and Δ_Q respectively, while a displacement is allowed in the Δ_N direction.

d. 3 = Δ_Z and Δ_R are rotated through an angle of $(\pi/2 - \alpha)$ and become Δ_N and Δ_Q respectively, while a displacement is allowed in the Δ_Q direction.

See Figure 2-16 for a geometric explanation of codes 2 and 3.

When using rotation codes:

Code 2 can exist only as Δ_Z coding.

Code 3 can exist only as Δ_R coding.

Codes 0 and 1 can appear in either column 4 or column 6, in addition to columns 8 and 10. Thus, there are twelve possible boundary conditions when rotation codes are used. ($\alpha = \phi$ for table below.)

	Free edge (possible to apply shear and/or membrane loads)	Δ_Q = 0, normal support (possible to apply membrane load)	Δ_N = 0, membrane support (possible to apply shear load)
Δ_T, Ω_θ free	1,2,3,1	1,2,0,1	1,0,3,1
Δ_T, Ω_θ fixed	0,2,3,0	0,2,0,0	0,0,3,0
Δ_T fixed Ω_θ free	0,2,3,1	0,2,0,1	0,0,3,1
Δ_T free Ω_θ fixed	1,2,3,0	1,2,0,0	1,0,3,0

Apex boundary conditions:

Since the closed apex ($\phi = 0$) angle is not acceptable input, the apex boundary conditions must be simulated at a small ϕ angle. These boundary conditions vary per Fourier harmonic, and are as follows:

n	Δ_T	Δ_Z	Δ_R	Ω_θ	angle
0.0	0	0	3	0	$\alpha = \phi$
1.0	1	2	0	1	$\alpha = \phi$
≥ 2.0	0	0	0	0	---

For a further discussion see Reference 6, Appendix C.

Note: In a multi-harmonic submission for a shell containing an apex, some approximation must be made since boundary conditions are not changed. If there is no load near the apex, and the actual membrane stress resultants are unknown, it can be left totally free.

General Notes:

1) To establish a datum for measuring displacement, free body motion must be eliminated from the structure. This should be accomplished by suitably applied boundary conditions.

2) The ability of a dependent joint in a kinematic link to prescribe motion independently should be removed by setting all boundary conditions of that joint to zero. See pages 2-62 and 2-78.

3) Any joint to which an elastic support is attached must be left free to move (elastically) in that direction. Therefore the boundary code for that direction is 1.

4) In an axisymmetric analysis, if no torsion loads are applied, a faster solution will result if all torsion degrees of freedom are removed.

	Column	Format
	minus in 1-80	

ELASTIC SUPPORT DATA (for initial harmonic only in a multi-harmonic submission)

1. Support Control Data Card

A.	Number of Elastic Supports ≤ 20 Note: Elastic supports can be applied only to region joints.	1-4	I4
B.	Any alphameric information (support description) Note: If there are no elastic supports for the structure for the initial harmonic, card 1 of the SUPPORT DATA is blank and card set 2 is omitted.	5-68	16A4

2. Support Stiffness Cards (as many as in item 1A above)

A.	Supported Region Joint Number	1-5	I5
B.	Stiffness applied to region joint in torsional direction (T_{11}).	6-19	E14.7
C.	Stiffness applied to region joint in Z direction (T_{22}).	20-33	E14.7
D.	Stiffness applied to region joint in radial direction (T_{33}).	34-47	E14.7
E.	Stiffness applied to region joint in moment direction (T_{44}).	48-61	E14.7

Notes: 1) The use of these support stiffnesses is varied. Since they are merely added into the structure stiffness matrix, they can represent actual elastic (spring) supports at region joints. If the analyst anticipates the existence of a ring at any region support, but has no design details and is thus unable to provide the ring information necessary on the ring cards, a preliminary estimate of the ring may be input here by stiffnesses. This option can also be used to simulate additional attached structure.

	Column	Format
2) The boundary condition codes for the supported joints should be 1 for the supported directions.		
D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging)		minus in 1-80

JOINT LOAD DATA (for initial harmonic only in a multi-harmonic submission)

1. Load Control Data Card

A.	Number of Joint Loads Total number of joint loads in analysis. (Line loads can only be applied to region joints.)	1-4	I4
B.	Any alphameric information (load description) Note: If there are no Joint Loads for the structure for the initial harmonic, card 1 of the JOINT LOAD DATA is blank and card set 2 is omitted.	5-68	16A4

2. Joint Load Cards (as many as in item 1A above)

A.	Load Condition Number Number of loading condition in which the line load exists. (See Program Control Card item 2E. For a multi-harmonic submission this number is always unity.)	1-5	I5
B.	Row Identification The identification is the location of the degree of freedom at which the load is applied. This is obtained by counting the non-zero codes entered in the Boundary Conditions Cards, starting with Joint 1; T, Z, R, Ω_θ, Joint 2; T, Z,.....etc., and stopping at the joint and degree of freedom where the line load is to be applied. The location number of this degree of freedom is the information necessary.	6-10	I5

	Column	Format
C. Applied Joint Load	11-24	E14.7

The input is $2\pi r_p$ times the running load in lb./in. In the particular case of the axial axisymmetric load, this is simply the net force. For sign convention see Figures 2-11, 2-16 and 2-17.

D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D minus in 1-80
(See General Notes - Data Debugging)

MULTI-HARMONIC DATA (This data set (items 1-4) is omitted for single harmonic submissions. Note that only one loading condition is allowed for multi-harmonic submissions.)

This data set consists of distributed segment load data, elastic support data, and line load data for the structure, per harmonic.

1. Segment Distributed Load Data (This data is provided in order of the processed segments for the whole structure.)

   A. Loading Clue Card for next harmonic (see previous discussion in segment card set 7)

      a. Load clues for temperature, circumferential, meridional, normal, circumferential moment, and meridional moment loads, for next harmonic. — 1-6 — 6I1

         Note: Variations in the types of loadings as well as magnitudes are allowed per harmonic. The thermal clue however is fixed and must remain constant for all harmonics. Thus if the first harmonic clue is 4 for example, and if the other harmonics are not thermally loaded, the Thermal Clue must remain 4, and zero (or stress-free) temperature values must be entered for other harmonics on the load cards.

      b. Table Control (see segment card 4 item H). This value does not change per harmonic. — 71-72 — I2

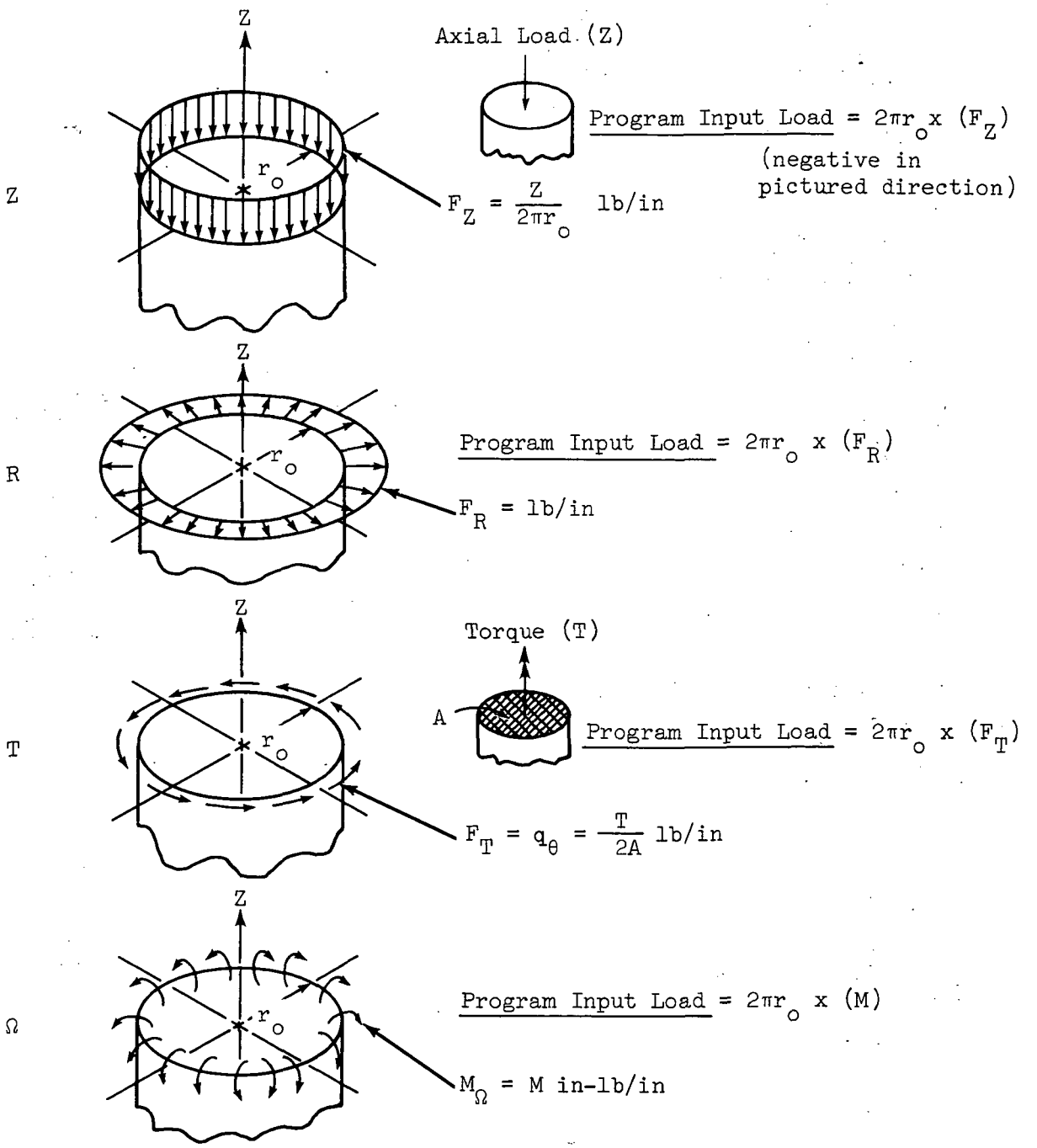
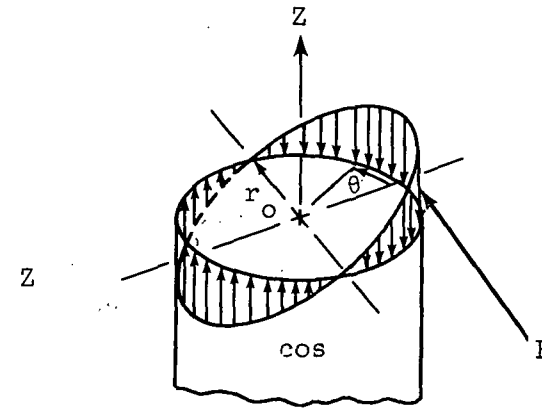
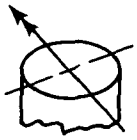


Figure 2-17a. Line Loading for Harmonic n = 0.0



Z

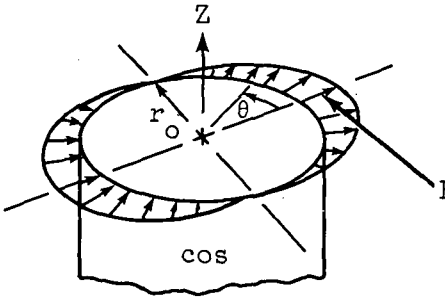
Moment (M_o)



$$\underline{\text{Program Input Load}} = 2\pi r_o \times (F_{Z\ max}) = \frac{2\ M_o}{r_o}$$

(negative in pictured direction)

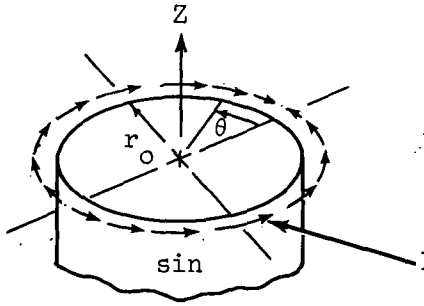
$$F_{Z\ max} = \frac{M_o \cos (0°)}{\pi r_o^2} \text{ lb/in}$$



R

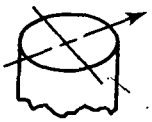
$$\underline{\text{Program Input Load}} = 2\pi r_o \times (F_{R\ max})$$

$$F_{R\ max} = F_{R\ max} \times \cos (0°) \text{ lb/in}$$



T

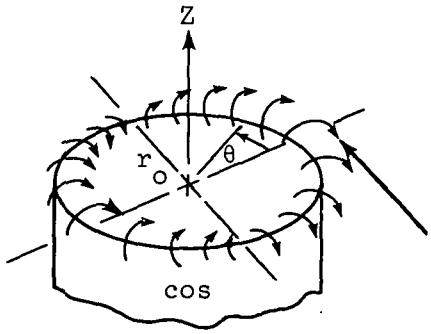
Shear (V_o)



$$\underline{\text{Program Input Load}} = 2\pi r_o \times (F_{T\ max})$$

$$= 2\ V_o \quad \text{(negative in pictured direction)}$$

$$F_{T\ max} = q_{\theta\ max} = \frac{V_o \sin (90°)}{\pi r_o} \text{ lb/in}$$



Ω

$$\underline{\text{Program Input Load}} = 2\pi r_o \times (M_{max})$$

$$M_{\Omega\ max} = M_{max} \cos (0°) \text{ in-lb/in}$$

Figure 2-17b Line Loading for Harmonic n = 1.0

	Column	Format
B. Table of Applied Loads for next harmonic (see segment card set 8). These cards contain the next harmonic loads as described previously in the segment data (card set 8) according to the Load Clues above.		5E14.7
Note: The above data sets (1A and 1B) are repeated until all the segments in the structure are completed for the next harmonic.		
2. Elastic Support Data for next harmonic		
A. Support Control Data Card for next harmonic		
a. Number of Elastic Supports ≤ 20	1-4	I4
b. Any alphameric information	5-68	16A4
Note: If no supports exist in this harmonic the above card is blank, and card set 2B (below) is omitted.		
B. Support Stiffness Cards for next harmonic (as many as in item Aa above)		
a. Supported Region Joint Number	1-5	I5
b. Stiffnesses applied to region joint in torsional, Z, radial, and moment directions for next harmonic (see previous Elastic Support Data Cards).	6-61	4E14.7
3. Joint Load Data for next harmonic		
A. Load Control Data Card for next harmonic		
a. Number of Joint Loads	1-4	I4
b. Any alphameric information	5-68	16A4
Note: If no joint loads exist in this harmonic the above card is blank, and card set 3B (below) is omitted.		
B. Joint Load Cards for next harmonic (as many as in item Aa above)		
a. Enter unity in column 5	1-5	I5

	Column	Format
b. Row identification (see previous Joint Load Card description)	6-10	I5
Note: Locations of line loads may change from harmonic to harmonic.		
c. Applied Joint Load	11-24	E14.7
The input is $2\pi r_o$ times the running load in lb./in. for this harmonic (see Figure 2-17).		
Note: The above data sets (1, 2, 3) are repeated for every harmonic until all the information is provided for every harmonic on the Harmonic Cards (see p. 2-18).		
D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging)		minus in 1-80

4. Circumferential Angle Data

A. Theta Angle Control Card

a. Number of theta angles ($1 \leq n \leq 36$). The number of theta angles that is required for a full description of the circumferential variation of the output quantities.	1-2	I2
b. Any alphameric information	3-66	16A4

B. Theta Angle Cards (≤ 8)

a. Theta angles in radians (Max. = 36). The theta angles at which the output is to be provided. A maximum of 36 angles is allowed making up at most 8 cards.		5E14.7

GRAPHICS DATA (This data is omitted if the clue on the Program Control Card item I was set to zero.)

1. Graphics Control Card

This card is divided into two data fields. The first field, 1-11, is for representing the item to be plotted, while the second field, 21-56, is for choosing the theta angle for which the output amplitude is to be plotted.

		Column	Format
A.	Circumferential Displacement Clue Clue = 1, plot u Clue = 0 or blank, do not plot u	1	I1
B.	Meridional Displacement Clue Clue = 1, plot v Clue = 0 or blank, do not plot v	2	I1
C.	Normal Displacement Clue Clue = 1, plot w Clue = 0 or blank, do not plot w	3	I1
D.	Transverse ϕ Shear Stress Clue Clue = 1, plot $\tau_{\zeta\phi}$ Clue = 0 or blank, do not plot $\tau_{\zeta\phi}$	4	I1
E.	Hoop Stress (inner face) Clue Clue = 1, plot $\sigma_{\theta\ in}$ Clue = 0 or blank, do not plot $\sigma_{\theta\ in}$	5	I1
F.	Meridional Stress (inner face) Clue Clue = 1, plot $\sigma_{\phi\ in}$ Clue = 0 or blank, do not plot $\sigma_{\phi\ in}$	6	I1
G.	In-plane Shear Stress (inner face) Clue Clue = 1, plot $\tau_{\phi\theta\ in}$ Clue = 0 or blank, do not plot $\tau_{\phi\theta\ in}$	7	I1
H.	Transverse θ Shear Stress Clue Clue = 1, plot $\tau_{\zeta\theta}$ Clue = 0 or blank, do not plot $\tau_{\zeta\theta}$	8	I1
I.	Hoop Stress (outer face) Clue Clue = 1, plot $\sigma_{\theta\ out}$ Clue = 0 or blank, do not plot $\sigma_{\theta\ out}$	9	I1
J.	Meridional Stress (outer face) Clue Clue = 1, plot $\sigma_{\phi\ out}$ Clue = 0 or blank, do not plot $\sigma_{\phi\ out}$	10	I1
K.	In-plane Shear Stress (outer face) Clue Clue = 1, plot $\tau_{\phi\theta\ out}$ Clue = 0 or blank, do not plot $\tau_{\phi\theta\ out}$	11	I1
L.	Theta angle location clues (or load case clues - see Note 2 for single harmonic submissions) Each item, starting in column 21, represents an angle on the Theta Angle Card in	21-56	36I1

	Column	Format
the order of that input. Thus column 21 represents the first theta angle, column 22 represents the second theta angle and so on up to the number input (Max. = 36). If the amplitude of the output variables of interest (chosen items from A through K) are to be plotted for a given angle, unity is inserted in that corresponding column. If no plots are to be made, the corresponding column is to be left blank.		
Notes: 1) Since in this way up to 396 plots per segment could be made, an arbitrary maximum number of plots was set at 56. This number is to be used as a maximum on the product of the chosen items to be plotted and the number of angles at which the plots are to be made.		
2) In a single harmonic submission, the field 21-30 on the Graphics Card represents the load cases (up to a maximum of 10) for which the chosen amplitudes (from columns 1-11) are to be plotted. Unity is inserted if the load case is to be plotted, and a zero or blank if not. The field 31-56 is left blank. The upper limit of 56 plots per segment still holds.		
D-A-S-H S-E-P-A-R-A-T-O-R C-A-R-D (See General Notes - Data Debugging)		minus in 1-80

NEW PROBLEM CARDS

In summary, in order to repeat a problem or to do several problems, the following options are available.

1. Loading changes - The present program allows up to ten separate loading cases on single harmonic submissions. This applies to distributed and line loads. No backup cards are needed for this purpose. (See input information.)
2. Harmonic changes - The program allows for the superposition of up to 25 harmonics. There can only be one load case with this option. The option is valid for coupled or uncoupled runs. No backup cards are needed for this purpose. (See input information.)
3. Full data duplication - The number of full data decks that can be backed up on one submission is limited only by time requirements.

It is hoped that the user is now able to use the STARS-2S program to good advantage. It is a powerful tool, which will increase in value to the user as he uses it. One of the more complex areas of usage is the description of topology, especially when involved with rotation codes and joint loads. An illustrative example of a Y joint representation is therefore presented below. (See Figures 2-18 and 2-19 for the structure and idealization.) The idealized structure contains four regions and two kinematic links. The joints are numbered from 1 to 7. Membrane loading is applied to joints 1 and 5 and the structure is supported by membrane action at joint 7. All regions must be coupled and we are interested in the 4^{th} harmonic only.

The second card in each region description (topology card) is as follows:

Region	Joint (i)	Joint (j)
1	1	2
2	2	3
3	4	5
4	6	7

The Joint Control Data card would contain a 7 in column 5 and a 2 in column 15.

In this example, the restraints at joints 1, 5 and 7 must be rotated from the fixed (global system) to a local system such that membrane action may be applied. In addition, joints 3 and 4, and 6 and 3 are to be coupled with kinematic links. Thus, the motions of joints 4 and 6 are dependent upon the motion of joint 3. This dependence will be insured by using 2 kinematic link cards and setting the displacements of joints 4 and 6 equal to zero. It should be noted in this particular case that the motion of joints 4 and 6 is not being equated to zero, but rather, the ability to prescribe motion independently is being removed. The required data has the following appearance.

A. Kinematic Link Cards (2 cards)

Joint (j)	Joint (i)	Angle
4	3	$\gamma+\pi$
6	3	γ

Note: In a double link of the type shown in Figure 2-19, one joint must be consistently independent (joint 3 in example).

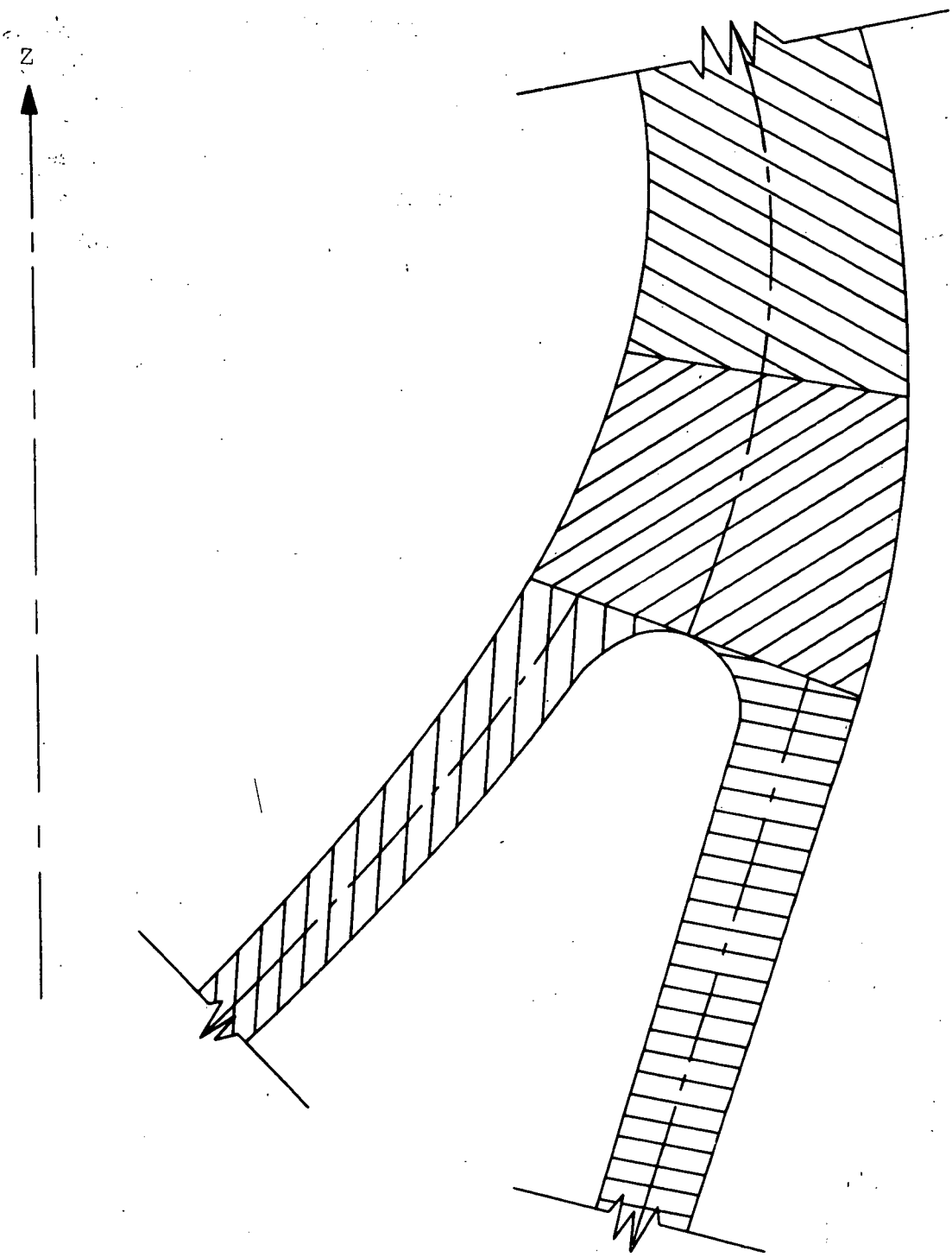


Figure 2-18. Y-Joint (Distorted Geometry)

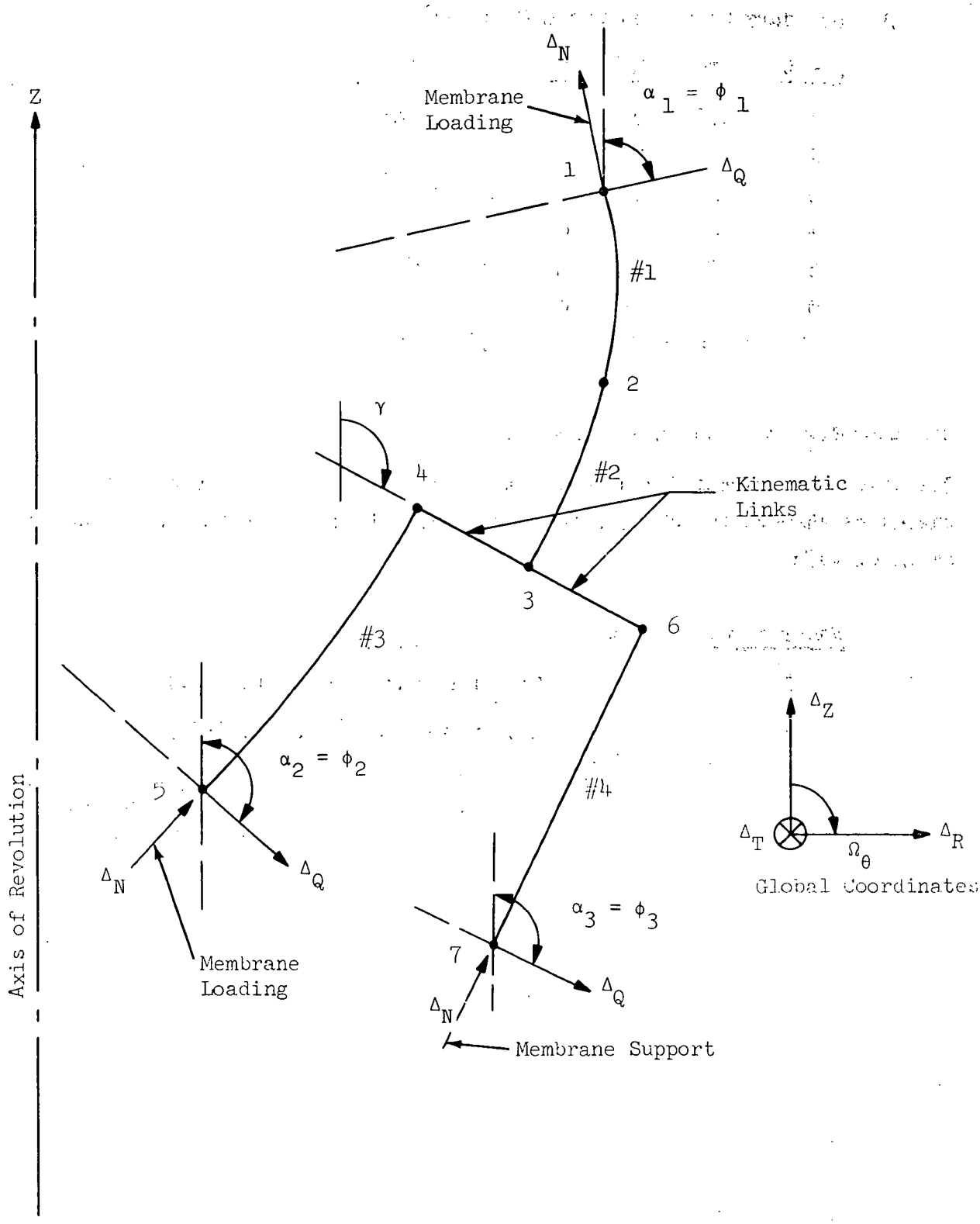


Figure 2-19. Idealized Y-Joint

B. Boundary Condition Cards (7 cards)

Joint	T	Z	R	θ	Angle
1	1	2	3	1	α_1
2	1	1	1	1	
3	1	1	1	1	
4	0	0	0	0	
5	1	2	3	1	α_2
6	0	0	0	0	
7	0	0	3	1	α_3

The Load Control Data card would contain a 2 in column 4.

The external membrane loads (one load problem assumed) are applied to the structure through the Joint Load Cards which, in this example, would appear as (2 cards):

Problem No.	Row	Load
1	2	$2\pi r_o$ x Membrane Load (lb./in.)
1	14	$2\pi r_o$ x Membrane Load (lb./in.)

SECTION 3

OUTPUT INFORMATION

The output of the STARS-2S program is straightforward, however a description is in order since the user should learn the significance of the various checks that are provided. It is important to point out that the output of the program will include a print-out of the input data. This gives the user the opportunity to check whether or not the input data was correct. In the detailed description of the complete output which follows, the user should refer to the output of the problems in Section 4 as an example.

The title page of the output contains all the data from the General Introductory Cards, prominently placed, and needs no comment. The next page of the output contains the first region Identification Card in the center. The following output is then presented for each segment in this region (in order of appearance):

1. Contents of segment Identification Card.
2. Contents of MAGIC Control Card
3. Contents of Geometric Description Card (Cards)
4. Contents of Master Clue Card
5. The material property table used for the segment
6. Crossection description table
7. Temperature load table (if any)
8. Distributed load tables (printed per loading condition)
9. Contents of Non-Linear Cards (if any)
10. Segment influence coefficients (MAGIC output)
11. Segment stiffness matrix
12. Stiffness matrix symmetry check
13. Segment load matrices
14. Radius of revolution at i^{th} and j^{th} ends of segment

Item 12, the stiffness matrix symmetry check, is a check upon the validity of segment sizing and the accumulation of round-off error. For perfect symmetry to exist, it is necessary to have zeros above the main diagonal, and zeros or ones below the diagonal. The amount of error induced by improper sizing or round-off is related to the amount that the off-diagonal terms in the lower triangle differ from unity. An attempt should be made to keep the upper limit on this difference at one percent (maximum number in lower triangle should be 0.1010... E 01).

As mentioned previously, items 1-14 are repeated for all the segments within region one. The radius of revolution at every joint should be checked at corresponding joints of adjacent segments to make sure that proper coupling has been specified. At this stage in the output, the topology of the segments within the region, and the description of the intra-region rings and kinematic links is presented.

Next the region matrices are presented. Given in order are: the region stiffness matrix, the stiffness matrix symmetry check, and the region load matrices. Again the numerical round-off, evident in the symmetry check, should be kept to a maximum of one percent (0.1010... E 01 in lower triangle). The output to this point, that is, sets of items 1-14, segment topology and links, and the region matrices, are now repeated as a group for each region within the structure. When this is completed, the region topology is presented. The next items to be provided by the output are the descriptions of the inter-region rings and kinematic links and the boundary conditions. At external points of the structure these are physical boundary conditions. At internal points they merely state the fact that no restraint exists and the joint in question is free to move. The last column in this set, gives the angle α, which is zero unless a rotation code is indicated. It is important to refer to Figure 2-6 once more and point out that α represents a rotation of the coordinate system. The final item in this output section presents the elastic support description.

There are a variety of errors that can be made in submitting input data. The STARS-2S program is set so that as an error is detected, (input or in the matrix calculations) the program is stopped. Therefore, to avoid delays in getting an answer, the SATELLITE-1S program was created to debug input data, and to check for other possible inconsistencies. The use of this program is described in Reference 3, and all the STARS error messages are contained in the listings therein.

After having corrected any errors, so that it is now possible for the program to run to completion, the problem solution can be discussed. The first item provided which represents the solution of the problem is the structure flexibility matrix. This matrix should also be checked for symmetry. After the reduced flexibility matrix, the applied line loads and the region end deflections are presented per problem. The deflection values are given for the region joints in numerical order, starting from joint 1.

From this point the output will depend upon the intermediate print clue. If this clue is set for full output the following items will be printed. First there will be a reproduction of some input data previously discussed. Next, there appears a diagram which outlines the format of the results tabulated per harmonic, at the beginning and end points of each segment. This tabulation is explained in Table 3-1. Below this tabulation will appear the numerical results at the segment ends. The following special cases may arise:

1. The 1,2 element will be zero for cylinders or cones.
2. The 2,3 and 2,4 elements will be equal for linear analyses.

All the above results will be for harmonic amplitudes until the final harmonic is completed. They will be separated by the segment and region harmonic stiffness and load matrices for each harmonic. At that time a different and more extensive tabulation diagram will be presented as shown in Table 3-2. The numerical results will then be printed for the prescribed print interval, rather than just segment ends,

	TABLE 3-1. Tabulated Intermediate Output Information	
1,1	PHI (RAD. OR IN.)	φ or s at which calculations are made
2,1	U	circumferential displacement
3,1	V	meridonal displacement
4,1	W	normal displacement
1,2	DEGREES	φ expressed in degrees
2,2	Q PHI	Q_{φ}, meridional transverse shear stress resultant
3,2	Q THETA	Q_{θ}, circumferential transverse shear stress resultant
4,2	OMEGA THETA	ω_{θ}, circumferential rotational displacement (rad)
5,2	OMEGA PHI	ω_{φ}, meridional rotational displacement (rad)
1,3	PRINT INERVAL	interval at which final answers are printed
2,3	J PHI	J_{φ}, effective meridional transverse shear stress resultant
3,3	N THETA	N_{θ}, circumferential force resultant
4,3	M THETA	M_{θ}, circumferential bending moment resultant
1,4	STEP	numerical integration step size
2,4	J PHI STAR	J^*_{φ}, non-linear effective tranverse shear stress resultant
3,4	N PHI	N_{φ}, meridional force resultant
4,4	M PHI	M_{φ}, meridional bending moment resultant
1,5	R ZERO	r_o, radius of revolution
2,5	T PHI THETA	$T_{\varphi\theta}$, effective in-place shear stress resultant
3,5	N PHI THETA	$N_{\varphi\theta}$, in-plane shear stress resultant
4,5	M PHI THETA	$M_{\varphi\theta}$, twisting moment resultant
1,6	BASE THICKNESS	basic shell wall thickness
2,6	N TEMPERATURE THETA	$N_{T\theta}$, circumferential temperature force resultant load
3,6	N TEMPERATURE PHI	$N_{T\varphi}$, meridional temperature force resultant load
4,6	M TEMPERATURE THETA	$M_{T\theta}$, circumferential temperature moment resultant load
5,6	M TEMPERATURE PHI	$M_{T\varphi}$, meridional temperature moment resultant load

TABLE 3-2. Tabulated Final Output Information

1,1	PHI (RAD. OR IN.)	φ or s at which calculations are made
2,1	EPSILON THETA	ϵ_θ, circumferential strain
3,1	U	circumferential displacement
4,1	V	meridional displacement
5,1	W	normal displacement
6,1	OMEGA THETA	ω_θ, circumferential rotational displacement (rad)
7,1	OMEGA PHI	ω_φ, meridional rotational displacement (rad)
1,2	DEGREES	φ, expressed in degrees
2,2	EPSILON PHI	ϵ_φ, meridional strain
3,2	Q PHI	Q_φ, meridional transverse shear stress resultant
4,2	J PHI	J_φ, effective meridional transverse shear stress resultant
5,2	Q THETA	Q_θ, circumferential transverse shear stress resultant
6,2	TAU ZETA PHI = Q/t	$\tau_{\zeta\varphi} = Q_\varphi/t$, meridional transverse shear stress
7,2	TAU ZETA THETA = Q/t	$\tau_{\zeta\theta} = Q_\theta/t$, circumferential transverse shear stress
1,3	PRINT INTERVAL	interval at which final answers are printed
2,3	GAMMA PHI THETA	$\gamma_{\varphi\theta}$, shear strain
3,3	K PHI THETA	$k_{\varphi\theta}$, specific twist
4,3	N THETA	N_θ, circumferential force resultant
5,3	M THETA	M_θ, circumferential bending moment resultant
6,3	SIGMA THETA IN	$\sigma_{\theta in}$, circumferential stress on inside fiber
7,3	SIGMA THETA OUT	$\sigma_{\theta out}$, circumferential stress on outside fiber
1,4	STEP	numerical integration step size
2,4	K PHI	k_φ, meridional curvature
3,4	J PHI STAR	J^*_φ, non-linear effective transverse shear stress resultant
4,4	N PHI	N_φ, meridional force resultant
5,4	M PHI	M_φ, meridional bending moment resultant
6,4	SIGMA PHI IN	$\sigma_{\varphi in}$, meridional stress on inside fiber
7,4	SIGMA PHI OUT	$\sigma_{\varphi out}$, meridional stress on outside fiber

TABLE 3-2. (Continued)

1,5	R ZERO	r_o, radius of revolution
2,5	K THETA	k_θ, circumferential curvature
3,5	T PHI THETA	$T_{\varphi\theta}$, effective in-plane shear stress resultant
4,5	N PHI THETA	$N_{\varphi\theta}$, in-plane shear stress resultant
5,5	M PHI THETA	$M_{\varphi\theta}$, twisting moment resultant
6,5	TAU PHI THETA IN	$\tau_{\varphi\theta_{in}}$, in-plane shear stress on inside fiber
7,5	TAU PHI THETA OUT	$\tau_{\varphi\theta_{out}}$, in-plane shear stress on outside fiber
1,6	BASE THICKNESS	basic shell wall thickness
2,6	N TEMPERATURE THETA	$N_{T\theta}$, circumferential temperature force resultant load
3,6	N TEMPERATURE PHI	$N_{T\varphi}$, meridional temperature force resultant load
4,6	M TEMPERATURE THETA	$M_{T\theta}$, circumferential temperature moment resultant load
5,6	M TEMPERATURE PHI	$M_{T\varphi}$, meridional temperature moment resultant load
6,6	SIGMA F IN	σ_{Fin}, Huber-von Mises-Hencky effective stress
7,6	SIGMA F OUT	σ_{Fout}, Huber-von Mises-Hencky effective stress

and in a Fourier sum form per theta angle. The following new special cases may arise:

1. The 6,2 and 7,2 elements will not be calculated for non-sandwich construction and will be printed as zero.
2. The 6,6 and 7,6 elements will not be calculated for reinforced constructions and will be printed as zero.
3. No stresses will be calculated for the ST10 or RWAF options.
4. The 6,3 and 7,3 and the 6,4 and 7,4 elements will actually be in the waffle grid directions for RWA1, RWA2, or RWA3 options (see Appendix B).
5. The 6,5 and 7,5 elements will not be calculated at reinforcement edges (they will be calculated in the basic shell) and will be printed as zero.

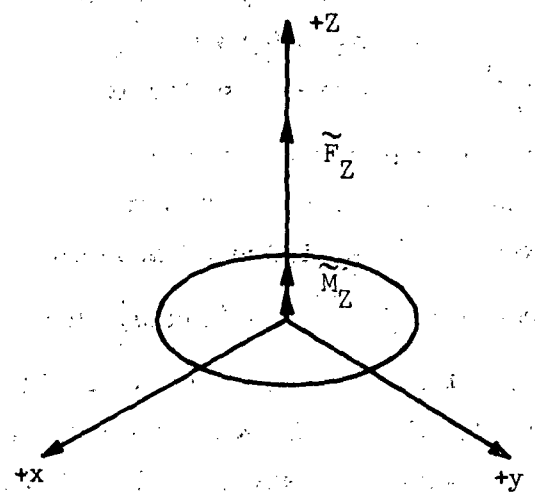
If the intermediate print is turned off, all the print discussed above pertaining to harmonic amplitudes will not be available. A restarted run will always provide the initial print items 1-14, and will then continue from the restarted harmonic depending upon the intermediate print clue. This completes the program output. The user is reminded to check continuity of stress resultants across segment boundaries where applicable.

In utilizing the program, it is frequently necessary to relate applied edge loads to the net forces across a section. The relation between forces in the fixed (global) coordinate system and any rotated coordinate system is given by(References 2 and 4):

$$\begin{Bmatrix} F_T \\ F_Z \\ F_R \\ M \end{Bmatrix}^{(n)} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -s\phi & -c\phi & 0 \\ 0 & +c\phi & -s\phi & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{Bmatrix} F_T \\ F_N \\ F_Q \\ M \end{Bmatrix}^{(n)} \tag{3-1}$$

for any harmonic "n" (see Figure 2-16b).

The relations between the net resultant external loads and the magnitudes of distributed edge loads are:



Axisymmetric Loads (n = 0)

$$\begin{Bmatrix} \tilde{F}_Z \\ \tilde{M}_Z \end{Bmatrix} = 2\pi r_o \begin{bmatrix} 0 & 1 & 0 & 0 \\ r_o & 0 & 0 & 0 \end{bmatrix} \begin{Bmatrix} F_T \\ F_Z \\ F_R \\ M \end{Bmatrix}^{(0)} \qquad (3\text{-}2)$$

Antisymmetric Loads (n = 1)

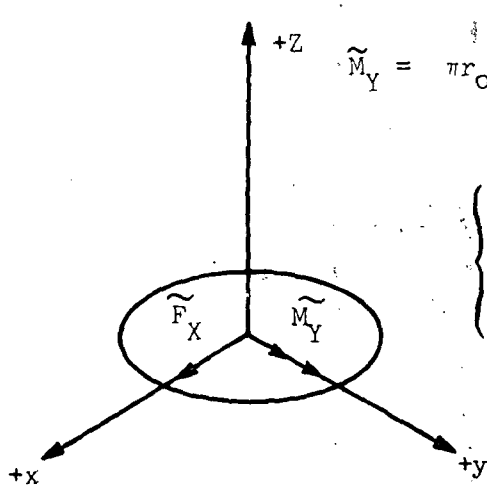
Here, the integration of the distributed forces is not obvious.

$$\tilde{F}_X = \int_0^{2\pi} \left(-F_T^{(1)} r_o d\theta\right) \sin\theta + \int_0^{2\pi} \left(F_R^{(1)} r_o d\theta\right) \cos\theta$$

$$\tilde{F}_X = \pi r_o \left[-F_T^{(1)} + F_R^{(1)}\right]$$

$$\tilde{M}_Y = \int_0^{2\pi} \left(-F_Z^{(1)} r_o d\theta\right) (r_o \cos\theta) + \int_0^{2\pi} \left(M^{(1)} r_o d\theta\right) \cos\theta$$

$$\tilde{M}_Y = \pi r_o \left[-r_o F_Z^{(1)} + M^{(1)}\right] \qquad (3\text{-}3)$$



$$\begin{Bmatrix} \tilde{F}_X \\ \tilde{M}_Y \end{Bmatrix} = \pi r_o \begin{bmatrix} -1 & 0 & +1 & 0 \\ 0 & -r_o & 0 & +1 \end{bmatrix} \begin{Bmatrix} F_T \\ F_Z \\ F_R \\ M \end{Bmatrix}^{(1)}$$

When the loaded edge has standard coordinates, Equations (3-2 or 3-3) are used to relate the applied edge loads to the new forces across a section. In the axisymmetric case, this is straightforward: contributions to $\tilde{F}_Z$ are made only by $F_Z^{(0)}$ and there is a similar relation between $\tilde{M}_Z$ and $F_T^{(0)}$. However, in the antisymmetric case, there are four unknowns and only two equations. Thus, additional data is required. Often, these loads are applied in a region of assumed membrane stress; then $F_R^{(1)} = 0$ (cylinder) or $F_Z^{(1)} = 0$ (plate), and $M^{(1)} = 0$, since these are transverse shear and bending stress resultants. When the load is applied at an angle to the fixed (global) coordinates, Equation (3-1) is used to transform Equations (3-2 and 3-3) into a form which permits evaluation of $F_T^{(1)}$ and $F_N^{(1)}$ (for membrane problems only: $\Phi = \alpha$, $M = F_Q = 0$).

It is frequently desirable to be able to calculate net forces at a cut section, or a built-in edge directly from output values, in order to check equilibrium. The net forces in terms of the stress resultants (in local coordinates as they appear in the output) are:

$$\begin{Bmatrix} \tilde{F}_Z(^i_j) \\ \tilde{M}_Z(^i_j) \end{Bmatrix} = \pm 2\pi r_o \begin{bmatrix} 0 & +s\phi & +c\phi & 0 \\ -r_o & 0 & 0 & 0 \end{bmatrix} \begin{Bmatrix} T_{\phi\theta}(^i_j) \\ N_\phi(^i_j) \\ J_\phi(^i_j) \\ M_\phi(^i_j) \end{Bmatrix}^{(0)} \qquad (3-^4_5)$$

and

$$\begin{Bmatrix} \tilde{F}_X(^i_j) \\ \tilde{M}_Y(^i_j) \end{Bmatrix} = \pm \pi r_o \begin{bmatrix} +1 & -c\phi & +s\phi & 0 \\ 0 & -r_o s\phi & -r_o c\phi & +1 \end{bmatrix} \begin{Bmatrix} T_{\phi\theta}(^i_j) \\ N_\phi(^i_j) \\ J_\phi(^i_j) \\ M_\phi(^i_j) \end{Bmatrix}^{(1)} \qquad (3-^6_7)$$

where the sign is chosen to correspond with the edge (i or j) on which the applied force is desired.

Equations (3-4 through 3-7) should be used to check overall shell equilibrium for unfamiliar geometries since this is a good check on the solution to the problem.

SECTION 4

EXAMPLES OF INPUT AND SOLUTIONS

This section contains the full input and output of an example test problem to the STARS-2S program. The problem was chosen to illustrate a variety of different inputs rather than from a physical point of view.

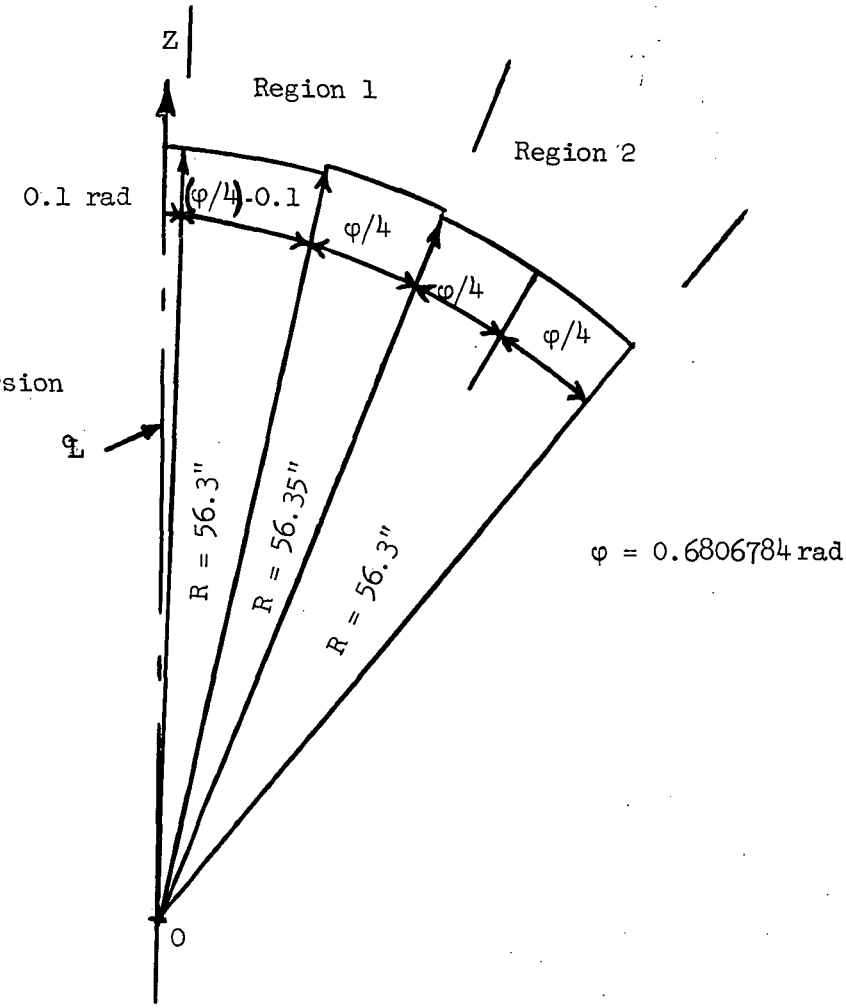
The test problem is presented in Figure 4-1. The clamped spherical cap is to be analyzed under a multi-harmonic loading involving both distributed and line loads. In addition, a ring is simulated by elastic support data as would be the case in an early version of design where the final ring geometry is unknown. The shell segments are of various wall cross-sections, exemplifying typical input requirements. The intermediate print clue has been set for full output and graphic displays of some output variables have been requested.

Loading Data

a) Shell is loaded in n = 0, 1, 2 harmonics

b) Amplitudes of normal load are f = +100.

c) Amplitudes of concentrated torsion load at region joint 1 are $+50./2\pi r_o$



STRUCTURAL PERTINENT DATA

Region 1

a) Segment 1: Single Sheet

b) Segment 2: Single Sheet reinforced by waffle

c) Joint 2 has a ring simulated by elastic support input

d) Segments 1 and 2 are separated by a kinematic link

Region 2

a) Segment 1 : Equal face sheet sandwich reinforced by isogrid

b) Segment 2 : Unequal face sheet sandwich reinforced by rings and stringers

c) Joint 4 is fixed

d) Region joints 2 and 3 are separated by a kinematic link

Figure 4-1 Test Problem

```
 XQT STARSS
 TEST PRØBLEM 1 - KINEMATIC LINKS, STIFFNESS CØNSTINTS, LINE LØADS
 2  4 2 3 1100 1
  0.0  1.0  2.0
STEEL     ØRTHØTRØPIC
0.0            0.0          0.0          0.0          0.0
0.0            0.0          0.0          0.0          0.0
0.30      E 080.0           0.0          0.0          0.0

0.30      E 080.0           0.0          0.0          0.0
0.0            0.0          0.0          0.0          0.0
0.2            0.0          0.0          0.0          0.0
0.0            0.0          0.0          0.0          0.0
1.25      E-060.0           0.0          0.0          0.0
0.0            0.0          0.0          0.0          0.0
1.25      E-060.0           0.0          0.0          0.0

0.125     E 08

STRE      STIF


 .3       E 08

 .3       E 08

 .2

 .125     E-05

 .125     E-05

 .125     E 08

 .3       E 08

 .3       E 08

 .125     E-05

 .125     E-05
-------------------------------------------------------- ---------- ----    -----
 2 1   1 REGIØN   2 SEGMENTS
    1    1    2
11 FIRST PART ØF REG. NØ. 1
 0.01             1.0   E-04 1.7017   E-03                              0.
 56.3           1.0
ØRTHØTRØPISTEEL      SINGLE     THICKNESS NØTHERMAL 0.0       LINEAR      2
 1.01      E-01 1.7016959E-01
 2.36           2.36
000100
1000.          1000.
    1    1    2
-------------------------------------------------------------------------------
11 SECØND PART ØF REG. NØ.1
 0.01             1.0   E-04 1.7017   E-03                              0.
 56.35          1.0
STIF      STRE       BLAN      RWA1      NØTH      0.0       LINE        2
 1.7016959E-01 3.4033918E-01
 1.0            1.0
```

```
 0.1             0.1
 1.0             1.0
 1.0             1.0
 .7854            .7854
 0.1             0.1
000100
1000.            1000.
WAFF       SHEL       WAFF       SHEL
 1.0              1.0
-.1               -.1
    2    3    4
-------------------------------------------------------------------------------
 3 2 0.1701695
-------------------------------------------------------------------------------
 2 0   1 REGIØN   2 SEGMENT
    2    3    4
11 FIRST  PART ØF REG. NØ. 2
 0.01 .              1.0   E-04 1.7017   E-03                          0.
 56.3             1.0
STIF       STRE       BLAN       ISG2       NØTH       0.0        LINE        2
 3.4033918E-01 5.1050878E-01
 1.0              1.0
 0.1              0.1
 1.0              1.0
 1.0              1.0
 .52360           .52360
 0.1              0.1
 0.1              0.1
000100
1000.            1000.
ISGR       SHEL       ISGR       SHEL
 1.0              1.0
-.1               -.1
    1    1    2
-------------------------------------------------------------------------------
11 SECØND PART ØF REG. NØ.2
 0.01                1.0   E-04 1.7017   E-03                          0.
 56.3             1.0
STIF       STRE       BLAN       ST13       NØTH       0.0        LINE        2
 5.1050878E-01 6.8067837E-01
 1.0        E 07  1.0        E 07
 1.0        E 07  1.0        E 07
 1.0              1.0
 1.0              1.0
 0.1              0.1
 0.1              0.1
 1.0              1.0
 1.0              1.0
 1.0              1.0
 1.0              1.0
 0.1              0.1
 0.1              0.1
 0.1              0.1
000100
1000.            1000.
STRI       STRI       RING       RING
 1.0              1.0
 1.0              1.0
 1.0              1.0
 1.0              1.0
    2    2    3
```

```
    4     0     1
 3 2  1.5
 1 1 0 3 00.101
 2 1 1 1 1
 3 0 0 0 0
 4 0 0 0 0
   1
    2 1.0       E 07 1.0       E 07 1.0       E 07     0.0
   1
    1     1    50.
000100                                                                  2
1000.            1000.
000100                                                                  2
1000.            1000.
000100                                                                  2
1000.            1000.
000100                                                                  2
1000.            1000.
   1
    2 1.0       E 07 1.0       E 07 1.0       E 07     0.0
   1
    1     1    50.
000100                                                                  2
1000.            1000.
000100                                                                  2
1000.            1000.
000100                                                                  2
1000.            1000.
000100                                                                 02
1000.            1000.
   1
    2 1.0       E 07 1.0       E 07 1.0       E 07     0.0
   1
    1     1    50.
 800
   0.0           .7854          1.5708         2.3562         3.1416
   3.9270        4.7124         5.4978
  1  1                1  1
FIN
```

UNSYMMETRIC, ORTHOTROPIC, REINFORCED SHELL ANALYSIS WITH COUPLING OF AT MOST 29 SHELL REGIONS

STARS 2S

AS OF JULY 1, 1972

NUMBER OF SEGMENTS = 4 NUMBER OF REGIONS = 2 NUMBER OF MATERIAL PROPERTY TABLES USED = 2 NUMBER OF PROBLEMS = 1

NUMBER OF HARMONICS= 3 HARMONIC 1 N= .0000000
HARMONIC 2 N= .1000000+01
HARMONIC 3 N= .2000000+01

THE GIVEN INPUT DATA INDICATES THAT THE SHELL SEGMENTS ARE TO BE COUPLED

TEST PROBLEM 1 - KINEMATIC LINKS, STIFFNESS CONSTINTS, LINE LOA

FOR INFORMATION CALL V. SVALBONAS
(516) 575-7701

P. OGILVIE

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

DTAU	DIFF	STEP	DELTA
.1000000-01	.1000000-03	-.1701700-02	0.

GEOMETRY INPUT VARIABLES

.5630000+02 .1000000+01 .0000000

ORTH STEE SING THIC NOTH T FREE = .000 LINE NUMBER OF TABLE COLUMNS = 2

MATERIAL PROPERTY TABLE USED

.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.20000+00	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1010000+00	.1701696+00
.2360000+01	.2360000+01

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

MATRIX X AND Y (TRANSPOSED) MAGIC OUTPUT

.1113562-13	.0000000	.0000000	.0000000	.1679583+01	.0000000	.0000000	.0000000
.0000000	.3977420+07	-.6834459+06	-.1275551+07	.0000000	.1027413+01	-.1823047-01	.4987847-01
.0000000	-.4030909+06	.6926370+05	.1292705+06	.0000000	.6609401-01	.9924519+00	-.5054926-02
.0000000	-.8421178+06	.1447023+06	-.1673540+07	.0000000	.1380804+00	.3863031+01	.1024343+01
.3544845+00	.0000000	.0000000	.0000000	.1051632-06	.0000000	.0000000	.0000000
.0000000	.7391290+00	-.6609401-01	-.1233547+00	.0000000	.4210920-07	.3330849-08	.4823599-08
.0000000	.7150760-01	-.5887459+00	-.2515858+01	.0000000	-.3088245-08	-.2201565-06	-.1575274-06
.0000000	.2941793-01	-.5054926-02	.7367526+00	.0000000	-.4823599-08	-.1877890-06	-.9061944-07
.0000000	-.1250259+03	-.3100911+04	-.5787393+04	.0000000	.1771978-05	.2289337-03	.2263072-03

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.5696507+09	.0000000	.0000000	.0000000	-.3391621+09	.0000000	.0000000	.0000000
FORCZ1	.0000000	.3456430+09	-.6714967+08	-.5806024+09	.0000000	-.3456430+09	.8063191+08	-.6849727+09
FORCR1	.0000000	-.6714968+08	.8633543+09	-.6153882+08	.0000000	.6714962+08	-.8365634+09	-.1119487+09
MOME 1	.0000000	-.5806024+09	-.6153883+08	.1418246+10	.0000000	.5806024+09	.5191185+08	.8129264+09
FORCT2	-.3391619+09	.0000000	.0000000	.0000000	.2019323+09	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.3456428+09	.6714959+08	.5806021+09	.0000000	.3456428+09	-.8063181+08	.6849724+09
FORCR2	.0000000	.8063188+08	-.8365630+09	.5191181+08	.0000000	-.8063182+08	.1046868+10	.1273310+09
MOME 2	.0000000	-.6849723+09	-.1119487+09	.8129259+09	.0000000	.6849723+09	.1273310+09	.1930182+10

SEGMENT SYMMETRY CHECK

.5696507+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.3456430+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.8633543+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1418246+10	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2019323+09	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000001+01	.1000001+01	.1000000+01	.3456428+09	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1046868+10	.0000000
.1000000+01	.1000001+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1930182+10

SEGMENT LOAD MATRICES

.0000000
.7990939+05
.9533273+04
-.5087532+05
.0000000
.1044398+06
.1580320+05
.6935501+05

RZERO(I) =	5.676637+00	RZERO(J) =	9.534376+00

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 1

DTAU	DIFF	STEP	DELTA
.1000000-01	.1000000+03	.1701700-02	0.

GEOMETRY INPUT VARIABLES

.5635000+02 .1000000+01 .0000000

STIF STRE BLAN RWAI NOTH T FREE = .000 LINE NUMBER OF TABLE COLUMNS = 2

MATERIAL PROPERTY TABLE USED

.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.20000+00	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1701696+00	.3403392+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.7854000+00	.7854000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04 .1000000+04

THE STRESS CLUES ARE WAFF SHEL WAFF SHEL

TABLE ORDER PHI OR S VS. STRESS PROPERTIES

.1000000+01	.1000000+01
-.1000000+00	-.1000000+00

MATRIX X AND Y (TRANSPOSED) MAGIC OUTPUT

.4059451-14	.0000000	.0000000	.0000000	.1971114+01	.0000000	.0000000	.0000000
.0000000	.1706650+06	-.6043568+05	-.3146512+06	.0000000	.6089015+00	.6421703-01	.6632253-01
.0000000	-.2932560+05	.1038474+05	.5406695+05	.0000000	.2340707+00	.9454219+00	-.1139629-01
.0000000	-.1208730+06	.4280336+05	.1503560+06	.0000000	.9647833+00	.6558082+01	.4794652+00
.2573810+00	.0000000	.0000000	.0000000	.4429384-06	.0000000	.0000000	.0000000
.0000000	.9183792+00	-.2340718+00	-.1218667+01	.0000000	.4650704-06	.7036821-06	.2568718-06
.0000000	.1925083+00	.4622531+00	.8557433+01	.0000000	-.5989437-06	-.6320753-05	-.1804482-05
.0000000	.3218218-01	-.1139631-01	.9670058+00	.0000000	-.2568713-06	-.2279501-05	-.4423772-06
.0000000	-.8396537+03	-.7111990+04	-.3696181+05	.0000000	.1448872-02	.1668475-01	.6665526-02

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.2668247+09	.0000000	.0000000	.0000000	-.1353675+09	.0000000	.0000000	.0000000
FORCZ1	.0000000	.2922540+08	-.2346823+08	-.8497453+08	.0000000	-.2922540+08	.4784869+08	-.9150865+08
FORCR1	.0000000	-.2346823+08	.8339124+08	-.4169401+07	.0000000	.2346820+08	-.1393465+09	-.4487093+08
MOME 1	.0000000	-.8497453+08	-.4169399+07	.4035061+09	.0000000	.8497453+08	-.1165009+08	.2800147+09
FORCT2	-.1353673+09	.0000000	.0000000	.0000000	.6867556+08	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.2922537+08	.2346818+08	.8497445+08	.0000000	.2922536+08	-.4784860+08	.9150858+08
FORCR2	.0000000	.4784865+08	-.1393463+09	-.1165008+08	.0000000	-.4784860+08	.2710495+09	.6704974+08
MOME 2	.0000000	-.9150857+08	-.4487089+08	.2800144+09	.0000000	.9150858+08	.6704973+08	.7991974+09

SEGMENT SYMMETRY CHECK

.2668247+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.2922540+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.8339124+08	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.4035061+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.6867556+08	.0000000	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.2922536+08	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.2710495+09	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.7991974+09

SEGMENT LOAD MATRICES

.0000000
.3373116+06
.9376725+05
-.5378644+06
.0000000
-.4881455+06
.1038368+06
-.8066653+06

RZERO(I) = 9.542844+00	RZERO(J) = 1.881001+01

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 1 NUMBER OF SEGMENT JOINTS 4 NUMBER OF KINEMATIC LINKS 1

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	3	4

SEGMENT LINKS

JOINT(J)	JOINT(I)	ANGLE OF ORIENTATION
3	2	.1701695+00

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.3245032+09	.0000000	.0000000	.0000000	-.9793103+08	.0000000	.0000000	.0000000
FORCZ1	.0000000	.1394938+08	-.1674162+08	-.5924818+08	.0000000	-.1394936+08	.3624344+08	-.4139376+08
FORCR1	.0000000	-.1674161+08	.2439016+09	-.7389907+07	.0000000	.1674159+08	-.1022388+09	-.3544212+08
MOME 1	.0000000	-.5924817+08	-.7389902+07	.4552641+09	.0000000	.5924814+08	-.5782647+08	.2136354+09
FORCT2	-.9793089+08	.0000000	.0000000	.0000000	.2955433+08	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.1394935+08	.1674157+08	.5924807+08	.0000000	.1394934+08	-.3624335+08	.4139373+08
FORCR2	.0000000	.3624340+08	-.1022387+09	-.5782639+08	.0000000	-.3624335+08	.2475858+09	.9172320+08
MOME 2	.0000000	-.4139372+08	-.3544208+08	.2136351+09	.0000000	.4139373+08	.9172319+08	.6212023+09

REGION SYMMETRY CHECK

.3245032+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1394938+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.2439016+09	.0000000	.0000000	.0000000	.0000000	.0000000

.1000000+01	.1000000+01	.1000001+01	.4552641+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.2955433+08	.0000000	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1394934+08	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.2475858+09	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.6212023+09

REGION LOAD MATRIX

.0000000
.3681197+06
.1018727+06
-.9422682+06
.0000000
.6416866+06
.1598705+09
.1350023+07

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

DTAU	DIFF	STEP	DELTA
.1000000+01	.1000000+03	.1701700+02	0.

GEOMETRY INPUT VARIABLES

.5630000+02 .1000000+01 .0000000

STIF STRE BLAN ISG2 NOTH T FREE = .000 LINE NUMBER OF TABLE COLUMNS = 2

MATERIAL PROPERTY TABLE USED

.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.20000+00	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.3403392+00	.5105088+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.5236000+00	.5236000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04 .1000000+04

THE STRESS CLUES ARE ISGR SHEL ISGR SHEL

TABLE ORDER PHI OR S VS. STRESS PROPERTIES

.1000000+01 .1000000+01

-.1000000+00 -.1000000+00

MATRIX X AND Y (TRANSPOSED) MAGIC OUTPUT

.2227851-14	.0000000	.0000000	.0000000	.1463785+01	.0000000	.0000000	.0000000
.0000000	.5079742+06	-.2844793+06	-.1318490+07	.0000000	.9564425+00	-.1223843+00	.1140232+00
.0000000	-.1798830+06	.1007393+06	.4661934+06	.0000000	.1796594+00	.8822476+00	-.4066102-01
.0000000	-.9441049+06	.5287242+06	.1170409+07	.0000000	.9081557+00	.8908105+01	.8356971+00
.4667081+00	.0000000	.0000000	.0000000	.5181885-06	.0000000	.0000000	.0000000
.0000000	.7875134+00	-.1796596+00	-.8692084+00	.0000000	-.1979218-06	.2543930-06	.9092983-07
.0000000	.2911564+00	.5750286+00	.6858785+01	.0000000	-.2319889-06	-.3079312-05	-.9091258-06
.0000000	.7260548-01	-.4066103-01	.7301719+00	.0000000	-.9092978-07	-.1034490-05	-.2031727-06
.0000000	-.1008441+04	-.7842465+04	-.3755977+05	.0000000	.5592877-03	.7754869-02	.3143628-02

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.3335593+09	.0000000	.0000000	.0000000	-.2278745+09	.0000000	.0000000	.0000000
FORCZ1	.0000000	.1800809+09	-.2065971+09	-.3369293+09	.0000000	-.1800808+09	.2440633+09	-.3274814+09
FORCR1	.0000000	-.2065971+09	.5347915+09	-.1130637+09	.0000000	.2065970+09	-.5564035+09	-.2040304+09
MOME 1	.0000000	-.3369293+09	-.1130637+09	.2073105+10	.0000000	.3369293+09	-.7282256+08	.1142027+10
FORCT2	-.2278744+09	.0000000	.0000000	.0000000	.1556748+09	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.1800807+09	.2065969+09	.3369291+09	.0000000	.1800807+09	-.2440630+09	.3274813+09
FORCR2	.0000000	.2440632+09	-.5564032+09	.7282252+08	.0000000	-.2440630+09	.6944427+09	.2481265+09
MOME 2	.0000000	-.3274812+09	-.2040304+09	.1142027+10	.0000000	.3274813+09	.2481265+09	.2668047+10

SEGMENT SYMMETRY CHECK

.3335593+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1800809+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.5347915+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2073105+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1556748+09	.0000000	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1800807+09	.0000000	.0000000
.1000000+01	.1000000+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.6944427+09	.0000000
.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2668047+10

SEGMENT LOAD MATRICES

.0000000
.5675299+06
.2589006+06
-.9779377+06
.0000000
.7003452+06
.3047035+06
-.1229104+07

RZERO(I) =	1.879332+01	RZERO(J) =	2.750937+01

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 2

DTAU	DIFF	STEP	DELTA
.1000000-01	.1000000-03	.1701708-02	0.

GEOMETRY INPUT VARIABLES

.5630000+02 .1000000+01 .0000000

STIF STRE BLAN STI3 NOTH T FREE = .000 LINE NUMBER OF TABLE COLUMNS = 2

MATERIAL PROPERTY TABLE USED

.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.20000+00	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.30000+08	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
.12500-05	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.5105088+00	.6806784+00
.1000000+08	.1000000+08
.1000000+08	.1000000+08
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

THE STRESS CLUES ARE STRI STRI RING RING

TABLE ORDER PHI OR S VS. STRESS PROPERTIES

.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01

MATRIX X AND Y (TRANSPOSED) MAGIC OUTPUT

.4816940-15	.0000000	.0000000	.0000000	.1287952+01	.0000000	.0000000	.0000000
.0000000	.2084801+06	-.1688239+06	-.7750651+06	.0000000	.1023869+01	.4056741-01	.8730027-01
.0000000	-.1167549+06	.9454590+05	.4340572+06	.0000000	.1478932+00	.8679968+00	-.4889049-01
.0000000	-.6196409+06	.4977264+06	.1325700+07	.0000000	.7679466+00	.9404343+01	.9066619+00
.6028382+00	.0000000	.0000000	.0000000	.3377223-05	.0000000	.0000000	.0000000
.0000000	.7854711+00	-.1478932+00	-.7058708+00	.0000000	.2536502-06	.2894270-06	-.1024397-06
.0000000	.2720892+00	.6513550+00	.7271815+01	.0000000	-.2719504-06	-.4272894-05	-.1283111-05
.0000000	.6037473-01	-.4889049-01	.6921911+00	.0000000	-.1024397-06	-.1397510-05	-.2776185-06
.0000000	-.9686848+03	-.8269045+04	-.3890781+05	.0000000	.6592175-03	.1057897-01	.4324218-02

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.6591745+08	.0000000	.0000000	.0000000	-.5118004+08	.0000000	.0000000	.0000000
FORCZ1	.0000000	.2893635+09	-.3046952+09	-.3285005+09	.0000000	-.2893635+09	.3096369+09	-.3070894+09
FORCR1	.0000000	-.3046952+09	.5544761+09	-.1946458+09	.0000000	.3046951+09	-.5255616+09	-.2514907+09
MOME 1	.0000000	-.3285005+09	-.1946458+09	.2332197+10	.0000000	.3285005+09	.1632982+09	.1209296+10
FORCT2	-.5118004+08	.0000000	.0000000	.0000000	.3973755+08	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.2893633+09	.3046950+09	.3285004+09	.0000000	.2893633+09	-.3096367+09	.3070893+09
FORCR2	.0000000	.3096368+09	-.5255614+09	.1632982+09	.0000000	-.3096367+09	.5654888+09	.2837524+09
MOME 2	.0000000	-.3070893+09	-.2514906+09	.1209295+10	.0000000	.3070893+09	.2837524+09	.2645274+10

SEGMENT SYMMETRY CHECK

.6591745+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.2893635+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.5544761+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2332197+10	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.3973755+08	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2893633+09	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.5654888+09	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2645274+10

SEGMENT LOAD MATRICES

.0000000
.7318533+06
.4893449+06
-.1389337+07
.0000000
.8344569+06
.5647057+06
.1617346+07

RZERO(I) =	2.750937+01	RZERO(J) =	3.543074+01

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 2 NUMBER OF SEGMENT JOINTS 3 NUMBER OF KINEMATIC LINKS 0

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	2	3

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.9922452+08	.0000000	.0000000	.0000000	-.5263105+08	.0000000	.0000000	.0000000
FORCZ1	.0000000	.8724812+08	-.1216337+09	-.1604618+09	.0000000	-.8724806+08	.1396052+09	-.5760580+06
FORCR1	.0000000	-.1216337+09	.2743912+09	.1953294+08	.0000000	.1216336+09	-.2147939+09	-.1367680+09
MOME 1	.0000000	-.1604618+09	.1953293+08	.1229408+10	.0000000	.1604618+09	-.1358344+09	.4110507+09
FORCT2	-.5263101+08	.0000000	.0000000	.0000000	.2791674+08	.0000000	.0000000	.0000000
FORCZ2	.0000000	-.8724798+08	.1216335+09	.1604616+09	.0000000	.8724792+08	-.1396049+09	.5761760+06
FORCR2	.0000000	.1396050+09	-.2147937+09	-.1358343+09	.0000000	-.1396049+09	.3108448+09	.2769299+09
MOME 2	.0000000	-.5760490+06	-.1367678+09	.4110504+09	.0000000	.5761600+06	.2769299+09	.1512508+10

REGION SYMMETRY CHECK

.9922452+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.8724812+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.2743912+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1229408+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.2791674+08	.0000000	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.8724792+08	.0000000	.0000000
.1000000+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.3108448+09	.0000000

.1000000+01	.1000016+01	.1000001+01	.1000001+01	.1000000+01	.1000028+01	.1000000+01	.1512508+10

REGION LOAD MATRIX

.0000000
.9561052+06
.8950818+06
-.3820522+07
.0000000
.1878080+07
.2980208+06
.5128011+07

INPUT DATA FOR REGION COUPLING

NUMBER OF REGION JOINTS 4 NUMBER OF KINEMATIC LINKS 1

REGION	JOINT(I)	JOINT(J)
1	1	2
2	3	4

REGION LINKS

JOINT(J)	JOINT(I)	ANGLE OF ORIENTATION
3	2	.1500000+01

BOUNDARY CONDITIONS

JOINT	DELTA T	DELTA Z	DELTA R	THETA	ANGLE ALPHA
1	1	0	3	0	.1010000+00
2	-1	1	1	1	.0000000
3	0	0	0	0	.0000000
4	0	0	0	0	.0000000

JOINT NUMBER = 2
STIFFNESS CONSTANTS T11 = 1.0000000+07 T22 = 1.0000000+07 T33 = 1.0000000+07 T44 = 0.0000000

THE REDUCED FLEXIBILITY MATRIX

ROW	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
1	.3152736-08	.0000000	.2356028-09	.0000000	.0000000	.0000000
2	.0000000	.8893825-07	.0000000	.8818463-09	-.1409192-08	.2296510-08
3	.2356025-09	.0000000	.7806909-09	.0000000	.0000000	.0000000
4	.0000000	.8818454-09	.0000000	.8010334-09	.5648253-10	.6904962-10
5	.0000000	-.1409190-08	.0000000	.5648254-10	.6177234-09	-.6704083-10
6	.0000000	.2296508-08	.0000000	.6904963-10	-.6704085-10	.6059902-09

EXTERNAL LINE LOADS

PROBLEM NUMBER	POINT OF APPLICATION	APPLIED LOAD
1	1	.5000000+02

THE EXPANDED REGION JOINT DISPLACEMENT MATRIX (REGION END DEFLECTIONS)

JOINT	PROBLEM	DELTA T	DELTA Z	DELTA R	OMEGA-THETA
1	1	.1576368-06	-.2783059-01	-.2820487-02	.0000000
2	1	.1178013-07	-.1493786-02	-.2867708-03	.5741179-03
3	1	.1176967-07	-.1484204-02	-.2874503-03	.5741179-03
4	1	.0000000	.0000000	.0000000	.0000000

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1010000+00 .1701696+00
.2360000+01 .2360000+01

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)
LOAD IDENTIFICATION CLUES 000100

.1000000+04 .1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TENPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
.1576368-06	-.2883911-02	-.2883911-02	-.2883911-02	-.1401842+01	.0000000
-.5820766-10	.0000000	-.3441020+05	.3836956+04	-.1401636+01	.0000000
.2797314-01	.0000000	.4363748+04	.2181874+05	.1155499-01	.0000000
	-.2799943-08				.0000000
.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
.1173419-06	-.1527281+04	-.1527281+04	-.1527281+04	-.4969312+00	.0000000
-.1906956-02	.0000000	-.1769197+05	-.7922879+04	-.4968585+00	.0000000
.2390639-01	-.1873789-02	.9050895+04	.1343041+05	.4096067-02	.0000000
	-.2084225-08				.0000000

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1701696+00	.3403392+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.7854000+00	.7854000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.) / U / V / W	DEGREES / Q PHI / Q THETA / OMEGA THETA / OMEGA PHI	PRINT INTERVAL / J PHI / N THETA / M THETA	STEP / J PHI STAR / N PHI / M PHI	R ZERO / T PHI THETA / N PHI THETA / M PHI THETA	BASE THICKNESS / N TEMPERATURE THETA / N TEMPERATURE PHI / M TEMPERATURE THETA / M TEMPERATURE PHI
.1701696+00	.9749999+01	.1000000+01	.1701700-02	.9542844+01	.1000000+00
.1174461-06	-.1525923+04	-.1525923+04	-.1525923+04	-.4960497+00	.0000000
.1813266-02	.0000000	-.7751538+04	-.7915852+04	-.4967201+00	.0000000
.2390640-01	-.1873788-02	.1302183+05	.1302271+05	-.3777557-01	.0000000
	-.2084225-08				.0000000
.3403392+00	.1950000+02	.1000000+01	.1701700-02	.1881001+02	.1000000+00
.1178013-07	-.6054415+04	-.6054415+04	-.6054415+04	-.1276738+00	.0000000
.2283142-03	.0000000	-.7398374+04	-.8149179+04	-.1278463+00	.0000000
.1503832-02	.5741183-03	-.2428510+05	-.2428786+05	-.9722715-02	.0000000
	-.2090529-09				.0000000

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.3403392+00	.5105088+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.5236000+00	.5236000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
.1176967-07	.8991869+04	.8991869+04	.8991869+04	-.9890082-02	.0000000
.2244747-03	.0000000	-.2616087+04	-.5871251+04	-.9902224-02	.0000000
.1495025-02	.5741179-03	-.9182941+04	-.2440808+05	-.6836236-03	.0000000
	-.2090528-09				.0000000
.5105088+00	.2925008+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
.1210335-07	-.2342990+03	-.2342990+03	-.2342990+03	-.4615781-02	.0000000
.5353281-03	.0000000	-.8433846+04	-.5483180+04	-.4621449-02	.0000000
.1028316-01	-.1611513-03	.3756713+04	.1246865+05	-.3190527-03	.0000000
	-.2149795-09				.0000000

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO.2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.5105088+00	.6806784+00
.1000000+08	.1000000+08
.1000000+08	.1000000+08
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
.1210334-07	-.2342987+03	-.2342987+03	-.2342987+03	-.4615781-02	.0000000
.5353281-03	.0000000	-.6216936+04	-.5483180+04	-.4612855-02	.0000000
.1028316-01	-.1611512-03	-.3374720+03	.1246865+05	.1647546-03	.0000000
	-.2149795-09				.0000000
.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
.1741086-15	-.7418685+04	-.7418685+04	-.7418685+04	-.2782570-02	.0000000
.6366629-10	.0000000	-.1096771+03	-.5576472+04	-.2780805-02	.0000000
-.5030071-09	-.2003464-09	-.1081432+02	-.2427555+05	.9932036-04	.0000000
	-.3092516-17				.0000000

*** HARMONIC I IS COMPLETE. IF JOB TERMINATES ABNORMALLY, SAVE TAPE SAVE14 FOR RESTART.

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.6274979+09	-.6578696+07	.1555683+09	-.3517011+07	-.2990920+09	-.2175658+08	.1728375+09	.7103803+07
FORCZ1	-.6578698+07	.3785052+09	-.6627667+08	-.5898710+09	.1379893+08	-.3633225+09	.7349693+08	-.6941287+09
FORCR1	.1555683+09	-.6627668+08	.8913746+09	-.6310188+08	-.7542853+08	.6173017+08	-.8112349+09	-.1118078+09
MOME 1	-.3517008+07	-.5898710+09	-.6310190+08	.1447287+10	-.5235523+07	.5842540+09	.5434933+08	.8060874+09
FORCT2	-.2990919+09	.1379892+08	-.7542850+08	-.5235526+07	.2754088+09	.4432376+07	-.5174534+08	.8117314+07
FORCZ2	-.2175656+08	-.3633223+09	.6173013+08	.5842537+09	.4432378+07	.3552806+09	-.7905434+08	.6967400+09
FORCR2	.1728374+09	.7349690+08	-.8112345+09	.5434928+08	-.5174534+08	-.7905435+08	.1035817+10	.1270288+09
MOME 2	.7103806+07	-.6941283+09	-.1118077+09	.8060868+09	.8117317+07	.6967400+09	.1270288+09	.1959163+10

SEGMENT SYMMETRY CHECK

.6274979+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.3785052+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.8913746+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1447287+10	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2754088+09	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000001+01	.1000001+01	.1000000+01	.3552806+09	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1035817+10	.0000000
.1000000+01	.1000001+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1959163+10

SEGMENT LOAD MATRICES

-.1517626+03
.8003334+05
.9519358+04
-.5039600+05

```
=.1750923+03
 .1043696+06
 .1585214+05
 .6880615+05
```

RZERO(I) = 5.676637+00 RZERO(J) = 9.534376+00

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 1

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.2567599+09	-.7095974+07	.4508606+08	-.9024691+07	-.1075352+09	-.2358360+08	.1041386+09	.9578680+07
FORCZ1	-.7095983+07	.3939277+08	-.2439477+08	-.9496539+08	.2097443+08	-.3254224+08	.3827324+08	-.9940340+08
FORCR1	.4508608+08	-.2439477+08	.9612521+08	-.9307820+07	-.6204949+08	.1612717+08	-.1130887+09	-.4355952+08
MOME 1	-.9024684+07	-.9496539+08	-.9307820+07	.4537057+09	-.7756407+07	.8656954+08	-.7473300+07	.2691145+09
FORCT2	-.1075352+09	.2097442+08	-.6204945+08	-.7756404+07	.8443445+08	-.4576677+07	.3894878+08	.1182911+08
FORCZ2	-.2358357+08	-.3254220+08	.1612716+08	.8656946+08	-.4576670+07	.3169520+08	-.4428742+08	.1030430+09
FORCR2	.1041385+09	.3827321+08	-.1130886+09	-.7473296+07	.3894874+08	-.4428742+08	.2561758+09	.6496724+08
MOME 2	.9578667+07	-.9940330+08	-.4355948+08	.2691142+09	.1182910+08	.1030430+09	.6496723+08	.8490371+09

SEGMENT SYMMETRY CHECK

.2567599+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.3939277+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.9612521+08	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.4537057+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000000+01	.8443445+08	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000002+01	.3169520+08	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.2561758+09	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.8490371+09

SEGMENT LOAD MATRICES

-.1061316+05
.3418661+06
.9098436+05
-.5133852+06

```
=.1248038+05
.4850307+06
.1095032+06
.7773638+06

RZERO(I) =     9.542844+00          RZERO(J) =     1.881001+01
```

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 1 NUMBER OF SEGMENT JOINTS 4 NUMBER OF KINEMATIC LINKS 1

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	3	4

SEGMENT LINKS

JOINT(J)	JOINT(I)	ANGLE OF ORIENTATION
3	2	.1701495+00

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.4130658+09	-.1667921+08	.2757288+09	-.1555962+08	-.5198593+08	-.1633062+08	.8522255+08	.1814476+08
FORCZ1	-.1667920+08	.3042043+08	-.2536261+08	-.6033538+08	.1772418+08	-.1644797+08	.2641814+08	-.5178477+08
FORCR1	.2757288+09	-.2536261+08	.3095056+09	-.5803339+07	-.4521144+08	.1070048+08	-.7901929+08	-.3303370+08
MOME 1	-.1555962+08	-.6033534+08	-.5803333+07	.5298123+09	-.2727820+08	.5860165+08	-.3704512+08	.2023016+09
FORCT2	-.5198585+08	.1772416+08	-.4521139+08	-.2727817+08	.5962980+08	-.4216866+07	.5290453+08	.2634693+08
FORCZ2	-.1633059+08	-.1644795+08	.1070047+08	.5860158+08	-.4216858+07	.1519291+08	-.3123653+08	.5494095+08
FORCR2	.8522241+08	.2641810+08	-.7901918+08	-.3704507+08	.5290448+08	-.3123652+08	.2170981+09	.7752300+08
MOME 2	.1814474+08	-.5178471+08	-.3303365+08	.2023013+09	.2634692+08	.5494095+08	.7752299+08	.6854725+09

REGION SYMMETRY CHECK

.4130658+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.3042043+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.3095056+09	.0000000	.0000000	.0000000	.0000000	.0000000

.1000000+01	.1000001+01	.1000001+01	.5298123+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.5962980+08	.0000000	.0000000	.0000000
.1000002+01	.1000001+01	.1000002+01	.1000001+01	.1000002+01	.1519291+08	.0000000	.0000000
.1000002+01	.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.2170981+09	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.6854725+09

REGION LOAD MATRIX

-.3686759+05
.3840400+06
.9683500+05
-.8660342+06
-.5669564+05
.6298440+06
.5887798+05
.1265354+07

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION.

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.3631960+09	-.5963543+07	.5577407+08	-.2451971+08	-.2063322+09	-.4037657+08	.1010498+09	.1562147+08
FORCZ1	-.5963576+07	.1841350+09	-.2078728+09	-.3404654+09	.3316653+08	-.1792080+09	.2350758+09	-.3315510+09
FORCR1	.5577413+08	-.2078728+09	.5434656+09	-.1176402+09	-.5601154+08	.2003649+09	-.5437032+09	-.2030522+09
MOME 1	-.2451970+08	-.3404654+09	-.1176403+09	.2098999+10	-.1559066+08	.3368350+09	.7752981+08	.1136399+10
FORCT2	-.2063320+09	.3316654+08	-.5601156+08	-.1559066+08	.1914487+09	-.6679407+06	.4112821+08	.2688018+08
FORCZ2	-.4037652+08	-.1792079+09	.2003648+09	.3368348+09	-.6679133+06	.1813862+09	-.2414093+09	.3343418+09
FORCR2	.1010496+09	.2350757+09	-.5437029+09	.7752975+08	.4112815+08	-.2414093+09	.6858809+09	.2455536+09
MOME 2	.1562146+08	-.3315509+09	-.2030521+09	.1136399+10	.2688017+08	.3343418+09	.2455536+09	.2693779+10

SEGMENT SYMMETRY CHECK

.3631960+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000005+01	.1841350+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.5434656+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2098999+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1914487+09	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000041+01	.1813862+09	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.6858809+09	.0000000
.1000000+01	.1000001+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.2693779+10

SEGMENT LOAD MATRICES

-.8431282+04
.5685980+06
.2579637+06
-.9724232+06

```
-.9394626+04
.6992749+06
.3068436+06
.1223012+07

 RZERO(I) =     1.879332+01        RZERO(J) =     2.750937+01
```

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO.2

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.8674274+08	-.2063720+07	.2752980+08	-.1690124+08	-.4136198+08	-.7560758+07	.1785097+08	.1011408+08
FORCZ1	-.2063720+07	.2901683+09	-.3053803+09	-.3279285+09	.4856944+07	-.2892057+09	.3081736+09	-.3082305+09
FORCR1	.2752980+08	-.3053803+09	.5552361+09	-.1937954+09	.1359183+07	.3044614+09	-.5263472+09	-.2525690+09
MOME 1	-.1690124+08	-.3279285+09	-.1937954+09	.2334908+10	-.1051034+08	.3278686+09	.1663837+09	.1210218+10
FORCT2	-.4136196+08	.4856942+07	.1359183+07	-.1051034+08	.6086094+08	.2912882+07	.1813979+08	.1799104+08
FORCZ2	-.7560755+07	-.2892056+09	.3044612+09	.3278685+09	.2912882+07	.2897805+09	-.3091092+09	.3084090+09
FORCR2	.1785096+08	.3081735+09	-.5263470+09	.1663837+09	.1813979+08	-.3091092+09	.5623378+09	.2806739+09
MOME 2	.1011409+08	-.3082304+09	-.2525689+09	.1210217+10	.1799104+08	.3084090+09	.2806739+09	.2647854+10

SEGMENT SYMMETRY CHECK

.8674274+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.2901683+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.5552361+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2334908+10	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.6086094+08	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2897805+09	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.5623378+09	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2647854+10

SEGMENT LOAD MATRICES

-.6403624+04
.7323213+06
.4898612+06
-.1389076+07

```
-.6993568+04
 .8339197+06
 .5663768+06
 .1617027+07

 RZERO(I) =    2.750937+01          RZERO(J) =    3.543074+01
```

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 2 NUMBER OF SEGMENT JOINTS 3 NUMBER OF KINEMATIC LINKS 0

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	2	3

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.1883878+09	.3049869+05	.8456517+08	-.9071665+08	-.3315553+08	-.2754521+08	.7066712+08	.8269997+08
FORCZ1	.3045900+05	.8969545+08	-.1270302+09	-.1546954+09	.5355396+07	-.8573855+08	.1324162+09	-.1353549+08
FORCR1	.8456525+08	-.1270302+09	.2908569+09	.1219744+08	-.2151644+07	.1182569+09	-.2084435+09	-.1316877+09
MOME 1	-.9071663+08	-.1546954+09	.1219741+08	.1247025+10	-.1650221+08	.1565227+09	-.1194164+09	.4325605+09
FORCT2	-.3315550+08	.5355395+07	-.2151651+07	-.1650219+08	.5417378+08	.6043802+07	.2316992+08	.4240855+08
FORCZ2	-.2754517+08	-.8573847+08	.1182568+09	.1565225+09	.6043801+07	.8838115+08	-.1397582+09	.5081872+07
FORCR2	.7066703+08	.1324160+09	-.2084433+09	-.1194162+09	.2316992+08	-.1397582+09	.3022803+09	.2567960+09
MOME 2	.8269988+08	-.1353548+08	-.1316875+09	.4325601+09	.4240855+08	.5081872+07	.2567960+09	.1490650+10

REGION SYMMETRY CHECK

.1883878+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1001303+01	.8969545+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.2908569+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000002+01	.1247025+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000003+01	.1000001+01	.5417378+08	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.8838115+08	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.3022803+09	.0000000

.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1490650+10

REGION LOAD MATRIX

-.3176826+06
.1003749+07
.8736325+06
-.3862574+07
-.9323442+05
.1859072+07
-.3677190+06
.5202498+07

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1010000+00	.1701696+00
.2360000+01	.2360000+01

PROBLEM 1 TABLE ORDER PHI OR S VS, DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.) / U- / V / W	DEGREES / Q PHI / Q THETA / OMEGA THETA / OMEGA PHI	PRINT INTERVAL / J PHI / N THETA / M THETA	STEP / J PHI STAR / N PHI / M PHI	R ZERO / T PHI THETA / N PHI THETA / M PHI THETA	BASE THICKNESS / N TEMPERATURE THETA / N TEMPERATURE PHI / M TEMPERATURE THETA / M TEMPERATURE PHI
.1010000+00	.5786874+01	.1000000+01	.1701700+02	.5676637+01	.2360000+01
.5404354-03	.1915717+04	-.2044678-02	-.2044678-02	-.1401789+01	.0000000
.0000000	-.2015434+04	-.1029588+05	-.4292667+04	-.1945606+03	.0000000
.1286451-01	.0000000	.1319441+05	.6569342+03	-.1087484+05	.0000000
	.2256622-02				.0000000
.1701696+00	.9749999+01	.1000000+01	.1701700+02	.9534376+01	.2360000+01
.8122774-03	-.5605970+03	-.1104534+04	-.1104534+04	-.2428494+04	.0000000
.6907599-03	-.1464036+04	-.5084475+04	-.4797804+04	-.2520610+04	.0000000
.1209656-01	-.5502306-03	.7965734+04	.8868595+04	-.5186102+04	.0000000
	-.1254304-02				.0000000

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1701696+00	.3403392+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.7854000+00	.7854000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TENPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
.8129987-03	-.4912028+03	-.1103552+04	-.1103552+04	-.2424186+04	.0000000
.6632485-03	-.2082241+04	-.4300658+04	-.4793548+04	-.2527887+04	.0000000
.1209656-01	-.5502305-03	.8620735+04	.8621057+04	-.5843553+04	.0000000
	.1253178-02				.0000000
.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
.5009472-03	-.6606951+04	-.6541699+04	-.6541699+04	-.1923520+04	.0000000
-.1492120-03	.3105232+04	-.3314665+04	-.3487571+04	-.1901738+04	.0000000
.1562940-02	.9424696-03	-.2123922+05	-.2124160+05	.1227401+04	.0000000
	.7420091-04				.0000000

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.3403392+00	.5105088+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.5236000+00	.5236000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS, DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI):

LOAD IDENTIFICATION CLUES 000100

.1000000+04 .1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
.5005026-03	.9020801+04	.9095761+04	.9095761+04	.3091435+04	.0000000
-.1555145-03	.1179939+04	-.2111883+04	-.4984115+04	.3116457+04	.0000000
.1548483-02	.9424694-03	-.8652370+04	-.2136665+05	.1408733+04	.0000000
	.7350547-04				.0000000
.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
.1723025-02	-.4217251+03	-.4426276+03	-.4426276+03	-.1328826+03	.0000000
.3001490-03	-.8203376+03	-.6713508+04	-.5013400+04	-.1430959+03	.0000000
.1129658-01	-.2376650-03	.4778538+04	.1345734+05	-.5750139+03	.0000000
	.3800402-03				.0000000

SEGMENT NUMBER 2 SEGMENT CODE 1-1 SECOND PART OF REG. NO. 2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.5105088+00	.6806784+00
.1000000+08	.1000000+08
.1000000+08	.1000000+08
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
U	Q PHI	J PHI	J PHI STAR	T PHI THETA	N TEMPERATURE THETA
V	Q THETA	N THETA	N PHI	N PHI THETA	N TEMPERATURE PHI
W	OMEGA THETA	M THETA	M PHI	M PHI THETA	M TENPERATURE THETA
	OMEGA PHI				M TEMPERATURE PHI
.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
.1723025-02	-.4348157+03	-.4426266+03	-.4426266+03	-.1328823+03	.0000000
.3001490-03	-.1719410+03	-.4809334+04	-.5013399+04	-.1366989+03	.0000000
-.1129658-01	-.2376652-03	.2628355+03	.1345734+05	-.2148751+03	.0000000
	.3800402-03				.0000000
.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
.2065728-09	-.7790135+04	-.7789540+04	-.7789540+04	-.5906673+03	.0000000
.1650165-09	.2428530+03	-.8086992+02	-.4906553+04	-.5902928+03	.0000000
-.7461138-09	-.3246889-09	-.1156117+02	-.2586491+05	.2108305+02	.0000000
	-.2472752-10				.0000000

*** HARMONIC 2 IS COMPLETE. IF JOB TERMINATES ABNORMALLY, SAVE TAPE SAVE15 FOR RESTART.

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.7796181+09	-.1438837+08	.3122638+09	-.5634994+07	-.2048521+09	-.3635687+08	.2895661+09	.1176986+08
FORCZ1	-.1438838+08	.4901860+09	-.6219037+08	-.6234864+09	.2398229+08	-.4132877+09	.5409909+08	-.7177082+09
FORCR1	.3122638+09	-.6219038+08	.9745168+09	-.6827002+08	-.1321441+09	.4690680+08	-.7430465+09	-.1112943+09
MOME 1	-.5634993+07	-.6234864+09	-.6827002+08	.1535355+10	-.8677080+07	.5928353+09	.6041730+08	.7844523+09
FORCT2	-.2048520+09	.2398228+08	-.1321440+09	-.8677086+07	.4638031+09	.1533416+08	.5041504+08	.1350448+08
FORCZ2	-.3635684+08	-.4132875+09	.4690677+08	.5928350+09	.1533416+08	.3905869+09	-.7645147+08	.7354891+09
FORCR2	.2895660+09	.5409906+08	-.7430461+09	.6041726+08	.5041505+08	-.7645148+08	.1027834+10	.1279585+09
MOME 2	.1176988+08	-.7177078+09	-.1112942+09	.7844520+09	.1350449+08	.7354890+09	.1279585+09	.2047088+10

SEGMENT SYMMETRY CHECK

.7796181+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.4901860+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.9745168+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1535355+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.4638031+09	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.3905869+09	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000001+01	.1000000+01	.1000000+01	.1027834+10	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2047088+10

SEGMENT LOAD MATRICES

-.2509702+03
.8026618+05
.9469791+04
-.4894510+05

```
-.2888638+03
 .1040760+06
 .1595568+05
 .6714792+05


RZERO(I) =     5.676637+00          RZERO(J) =     9.534376+00
```

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO.1

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.2345278+09	-.1022403+08	.7531387+08	-.1522641+08	-.3568537+08	-.3724623+08	.1685572+09	.1610513+08
FORCZ1	-.1022405+08	.7179738+08	-.2488614+08	-.1284441+09	.3381927+08	-.4243623+08	.1254109+08	-.1191606+09
FORCR1	.7531393+08	-.2488613+08	.1288179+09	-.2386802+08	-.9598412+08	-.2965103+07	-.4504051+08	-.4037047+08
MOME 1	-.1522640+08	-.1284441+09	-.2386802+08	.5905451+09	-.1257489+08	.9082389+08	.2365381+07	.2428169+09
FORCT2	-.3568535+08	.3381924+08	-.9598405+08	-.1257489+08	.1226346+09	-.4481851+07	.5663857+08	.1921969+08
FORCZ2	-.3724619+08	-.4243619+08	-.2965101+07	.9082385+08	-.4481837+07	.4054644+08	-.3620811+08	.1370591+09
FORCR2	.1685569+09	.1254108+08	-.4504046+08	.2365377+07	.5663851+08	-.3620811+08	.2235838+09	.6191924+08
MOME 2	.1610511+08	-.1191605+09	-.4037043+08	.2428172+09	.1921968+08	.1370591+09	.6191924+08	.9850373+09

SEGMENT SYMMETRY CHECK

.2345278+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000002+01	.7179738+08	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1288179+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.5905451+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1226346+09	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000003+01	.4054644+08	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.2235838+09	.0000000
.1000002+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.9850373+09

SEGMENT LOAD MATRICES

-.1709972+05
.3519345+06
.8400655+05
-.4530486+06

```
-.1922576+05
.4765139+06
.1221730+06
.7038910+06

RZERO(I) =     9.542844+00          RZERO(J) =     1.881001+01
```

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 1 NUMBER OF SEGMENT JOINTS 4 NUMBER OF KINEMATIC LINKS 1

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	3	4

SEGMENT LINKS

JOINT(J)	JOINT(I)	ANGLE OF ORIENTATION
3	2	.1701695+00

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.6254423+09	-.2770608+08	.4802520+09	-.1908350+08	.1532479+08	-.1151980+08	.7122797+08	.1847617+08
FORCZ1	-.2770607+08	.1024126+09	-.4308331+08	-.8891728+08	.2450981+08	-.2284923+08	.1660494+07	-.7122540+08
FORCR1	.4802520+09	-.4308331+08	.4925136+09	-.8505093+07	-.6302088+08	-.4767808+07	-.1574991+08	-.2488746+08
MOME 1	-.1908350+08	-.8891731+08	-.8505088+07	.7407340+09	-.3073275+08	.5737797+08	.2751250+06	.1731068+09
FORCT2	.1532472+08	.2450979+08	-.6302081+08	-.3073272+08	.1111601+09	-.6138406+05	.5906643+08	.3386001+08
FORCZ2	-.1151978+08	-.2284920+08	-.4767800+07	.5737788+08	-.6136956+05	.2253294+08	-.2660397+08	.9266447+08
FORCR2	.7122784+08	.1660494+07	-.1574990+08	.2751238+06	.5906636+08	-.2660397+08	.1777908+09	.5620189+08
MOME 2	.1847613+08	-.7122526+08	-.2488742+08	.1731065+09	.3386001+08	.9266445+08	.5620189+08	.8542425+09

REGION SYMMETRY CHECK

.6254423+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1024126+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.4925136+09	.0000000	.0000000	.0000000	.0000000	.0000000

.1000000+01	.1000000+01	.1000001+01	.7407340+09	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1111601+09	.0000000	.0000000	.0000000
.1000002+01	.1000001+01	.1000002+01	.1000001+01	.1000236+01	.2253294+08	.0000000	.0000000
.1000002+01	.1000000+01	.1000001+01	.1000004+01	.1000001+01	.1000000+01	.1777908+09	.0000000
.1000002+01	.1000002+01	.1000002+01	.1000002+01	.1000000+01	.1000000+01	.1000000+01	.8542425+09

REGION LOAD MATRIX

-.3633778+05
.4001238+06
-.7874872+05
-.6883564+06
-.6389075+05
.6026388+06
-.1290352+06
.1071178+07

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.4424507+09	-.1685377+08	.1166244+09	-.4467917+08	-.1526689+09	-.7109992+08	.1773783+09	.2687903+08
FORCZ1	-.1685383+08	.1978056+09	-.2119955+09	-.3527364+09	.5877053+08	-.1773793+09	.2109443+09	-.3424635+09
FORCR1	.1166245+09	-.2119956+09	.5704935+09	-.1311742+09	-.1003551+09	.1833344+09	-.5095501+09	-.2005267+09
MOME 1	-.4467916+08	-.3527364+09	-.1311742+09	.2177535+10	-.2665130+08	.3366690+09	.8960147+08	.1118544+10
FORCT2	-.1526688+09	.5877055+08	-.1003561+09	-.2665132+08	.2840700+09	.7078783+07	.5870139+08	.4853682+08
FORCZ2	-.7109982+08	-.1773792+09	.1833342+09	.3366688+09	.7078829+07	.1871324+09	-.2366711+09	.3550082+09
FORCR2	.1773781+09	.2109441+09	-.5095498+09	.8960141+08	.5870128+08	-.2366711+09	.6695465+09	.2401618+09
MOME 2	.2687900+08	-.3424633+09	-.2005266+09	.1118543+10	.4853681+08	.3550082+09	.2401618+09	.2771881+10

SEGMENT SYMMETRY CHECK

.4424507+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000003+01	.1978056+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.5704935+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2177535+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.1000000+01	.1000000+01	.2840700+09	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000007+01	.1871324+09	.0000000	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000002+01	.1000000+01	.6695465+09	.0000000
.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.1000000+01	.2771881+10

SEGMENT LOAD MATRICES

-.1461135+05
-.5711703+06
.2553746+06
-.9556165+06

```
      -.1625147+05
       .6961775+06
       .3121613+06
       .1204467+07

 RZERO(I) =     1.879332+01          RZERO(J) =     2.750937+01
```

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 2

STIFFNESS COEFFICIENTS

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.1350289+09	-.6610167+07	.5085058+08	-.2573075+08	-.2364615+08	-.1199533+08	.2625284+08	.1341246+08
FORCZ1	-.6610167+07	.2930238+09	-.3069659+09	-.3272481+09	.7467569+07	-.2889571+09	.3047716+09	-.3107580+09
FORCR1	.5085058+08	-.3069659+09	.5581206+09	-.1925366+09	.1228259+06	.3033881+09	-.5273495+09	-.2546841+09
MOME 1	-.2573075+08	-.3272481+09	-.1926366+09	.2345976+10	-.1411867+08	.3267461+09	.1724539+09	.1210241+10
FORCT2	-.2364613+08	.7467560+07	-.1228390+06	-.1411869+08	.1097362+09	.8698791+07	-.2520610+08	.2756317+08
FORCZ2	-.1199532+08	-.2889570+09	.3033880+09	.3267459+09	.8698790+07	.2915443+09	-.3086582+09	.3116967+09
FORCR2	.2625283+08	.3047715+09	-.5273493+09	.1724539+09	.2520610+08	-.3086582+09	.5572120+09	.2748551+09
MOME 2	.1341249+08	-.3107579+09	-.2546840+09	.1210240+10	.2756316+08	.3116967+09	.2748551+09	.2658617+10

SEGMENT SYMMETRY CHECK

.1350289+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.2930238+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.5581206+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.2345976+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000001+01	.1000106+01	.1000002+01	.1097362+09	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2915443+09	.0000000	.0000000
.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.5572120+09	.0000000
.1000002+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.1000000+01	.2658617+10

SEGMENT LOAD MATRICES

-.8832068+04
.7332139+06
.4907619+06
-.1386759+07

```
=.9848207+04
 .8327138+06
 .5695879+06
 .1614504+07


RZERO(I) =    2.750937+01          RZERO(J) =    3.543074+01
```

INPUT DATA FOR SEGMENT COUPLING

REGION NUMBER 2 NUMBER OF SEGMENT JOINTS 3 NUMBER OF KINEMATIC LINKS 0

SEGMENT	JOINT(I)	JOINT(J)
1	1	2
2	2	3

REGION STIFFNESS MATRIX

	DELTA T1	DELTA Z1	DELTA R1	THETA 1	DELTA T2	DELTA Z2	DELTA R2	THETA 2
FORCT1	.3444620+09	-.1906856+08	.1727165+09	-.1211351+09	-.1086107+08	-.4367824+08	.9809503+08	.9634709+08
FORCZ1	-.1906862+08	.1020347+09	-.1439180+09	-.1520261+09	.5212281+07	-.8256704+08	.1188514+09	-.3677488+08
FORCR1	.1727166+09	-.1439180+09	.3404646+09	-.5464532+07	-.2029314+07	.1093671+09	-.1935865+09	-.1226955+09
MOME 1	-.1211351+09	-.1520261+09	-.5464561+07	.1336257+10	-.1576018+08	.1481595+09	-.9326968+08	.4527418+09
FORCT2	-.1086105+08	.5212273+07	-.2029312+07	-.1576015+08	.1078732+09	.1408549+08	.2723262+08	.5246558+08
FORCZ2	-.4367816+08	-.8256696+08	.1093670+09	.1481594+09	.1408549+08	.9305035+08	-.1432633+09	.1487205+08
FORCR2	.9809488+08	.1188512+09	-.1935863+09	-.9326960+08	.2723262+08	-.1432634+09	.2947427+09	.2282922+09
MOME 2	.9634698+08	-.3677486+08	-.1226953+09	.4527414+09	.5246557+08	.1487203+08	.2282922+09	.1485987+10

REGION SYMMETRY CHECK

.3444620+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000003+01	.1020347+09	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000000+01	.3404646+09	.0000000	.0000000	.0000000	.0000000	.0000000
.1000000+01	.1000000+01	.1000005+01	.1336257+10	.0000000	.0000000	.0000000	.0000000
.1000001+01	.1000002+01	.1000001+01	.1000001+01	.1078732+09	.0000000	.0000000	.0000000
.1000002+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.9305035+08	.0000000	.0000000
.1000002+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000000+01	.2947427+09	.0000000

.1000001+01	.1000001+01	.1000001+01	.1000001+01	.1000000+01	.1000002+01	.1000000+01	.1485987+10

REGION LOAD MATRIX

-.3793730+06
.1087740+07
-.8317857+06
-.3832734+07
-.9668786+05
.1816933+07
.4706014+06
.5224954+07

REGION NUMBER 1

THERE ARE 2 SEGMENTS AND 1 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1010000+00	.1701696+00
.2360000+01	.2360000+01

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

-.1000000+04	-.1000000+04				
PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
EPSILON THETA	EPSILON PHI	GAMMA PHI THETA	K PHI	K THETA	N TEMPERATURE THETA
U	Q PHI	K PHI THETA	J PHI STAR	T PHI THETA	N TEMPERATURE PHI
V	J PHI	N THETA	N PHI	N PHI THETA	M TEMPERATURE THETA
W	Q THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE PHI
OMEGA THETA	TAU ZETA PHI = Q/T	SIGMA THETA IN	SIGMA PHI IN	TAU PHI THETA IN	SIGMA F IN
OMEGA PHI	TAU ZETA THETA = Q/T	SIGMA THETA OUT	SIGMA PHI OUT	TAU PHI THETA OUT	SIGMA F OUT

THETA ANGLE= .00000 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.6247336-03	.7530935-04	.0000000	-.2742894-03	-.8645534-03	.0000000
.0000000	.4162987+04	.0000000	-.3929138-02	.0000000	.0000000
-.6548362-10	-.3929138-02	-.4496329+05	-.3660754+04	.0000000	.0000000
.4461040-01	.0000000	.3147129+05	.1530758+05	.0000000	.0000000
.0000000	.0000000	.1485105+05	.1493933+05	.0000000	.1489539+05
.0000000	.0000000	-.5295553+05	-.1804167+05	.0000000	.4663029+05

THETA ANGLE= .78540 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.5911129-03	.1290917-03	-.8551576-05	-.5947718-03	-.2810924-03	.0000000
.5877327-03	.1354603+04	.5137391-03	-.4329718-02	-.2392959+01	.0000000
-.5820763-10	-.4329718-02	-.4169048+05	.8015988+03	-.2522715+03	.0000000
.3706970-01	-.3396813+04	.1369353+05	.2228329+05	-.1406816+05	.0000000
.0000000	.0000000	-.2913732+04	.2434493+05	-.1526220+05	.3702572+05
.2921243-02	.0000000	-.3241718+05	-.2366561+05	.1504841+05	.3902725+05

THETA ANGLE= 1.57080 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.5022792-03	.1959408-03	-.6595245-05	-.9402348-03	.4670270-03	.0000000
.5404339-03	-.2247283+04	.3971241-03	-.3883354-02	-.1401779+01	.0000000
-.5093170-10	-.3883354-02	-.3415296+05	.7042014+04	-.1945597+03	.0000000
.2420035-01	-.2015419+04	-.9549439+04	.2898683+05	-.1087479+05	.0000000
.0000000	.0000000	-.2475898+05	.3421074+05	-.1179760+05	.5520829+05
.2256612-02	.0000000	-.4184207+04	-.2824293+05	.1163272+05	.3321080+05

THETA ANGLE= 2.35620 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.4026036-03	.1737046-03	-.7755320-06	-.6800639-03	.2810910-03	.0000000
.1765570-03	-.1354602+04	.4788060-04	-.1438087-02	.4105331+00	.0000000
-.5820774-10	-.1438087-02	-.2712988+05	.6872311+04	-.2287821+02	.0000000
.1887655-01	.5465649+03	-.4966004+04	.2135414+05	-.1311156+04	.0000000
.0000000	.0000000	-.1684547+05	.2591631+05	-.1422172+04	.3739071+05
.2700963-03	.0000000	-.6145950+04	-.2009232+05	.1402784+04	.1799697+05

THETA ANGLE= 3.14160 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.3581418-03	.1384023-03	-.8689268-11	-.3949168-03	-.6949764-04	.0000000
-.9512674-09	.3315537+03	.5058014-09	.1602173-03	-.1031534-04	.0000000
-.6548362-10	.1602173-03	-.2437152+05	.4924581+04	-.2563331-03	.0000000
.1888138-01	-.1418803-01	.5082480+04	.1399371+05	-.1385080-01	.0000000
.0000000	.0000000	-.4851679+04	.1716179+05	-.1502976-01	.2003320+05
.2903295-08	.0000000	-.1580215+05	-.1298841+05	.1481253-01	.1460007+05

THETA ANGLE= 3.92700 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.4026052-03	.1737056-03	-.7755998-06	-.6800722-03	.2811006-03	.0000000
-.1765626-03	-.1354648+04	-.4788473-04	-.1438137-02	-.4105185+00	.0000000
-.5820753-10	-.1438137-02	-.2712998+05	.6872361+04	.2288023+02	.0000000
.1887657-01	-.5465440+03	-.4966276+04	.2135435+05	.1311269+04	.0000000
.0000000	.0000000	-.1684581+05	.2591656+05	.1422294+04	.3739122+05
-.2701198-03	.0000000	-.6145699+04	-.2009253+05	-.1402904+04	.1799725+05

THETA ANGLE= 4.71240 RADIANS

.1010000+00	.5786874+01	.1000000-01	.1701700-02	.5676637+01	.2360000+01
-.5022811-03	.1959403-03	.6595359-05	-.9402339-03	.4670211-03	.0000000
-.5404400-03	-.2247255+04	-.3971309-03	-.3883384-02	.1401820+01	.0000000
-.5093170-10	-.3883384-02	-.3415311+05	.7041951+04	.1945631+03	.0000000
.2420054-01	.2015477+04	-.9549245+04	.2898684+05	.1087498+05	.0000000
.0000000	.0000000	-.2475884+05	.3421072+05	.1179781+05	.5520829+05

-.2256651-02	.0000000	-.4184480+04	-.2824297+05	-.1163292+05	.3321096+05

THETA ANGLE= 5.49780 RADIANS

.1010000+00	.5786874+01	.1000000+01	.1701700-02	.5676637+01	.2360000+01
-.5911142-03	.1290901-03	-.8551508-05	-.5947623-03	-.2811103-03	.0000000
-.5877271-03	.1354689+04	-.5137349-03	-.4329710-02	.2392944+01	.0000000
-.5820785-10	-.4329710-02	-.4169059+05	-.8014601+03	.2522695+03	.0000000
.3706994-01	.3396792+04	.1369408+05	.2228308+05	.1406805+05	.0000000
.0000000	.0000000	-.2913192+04	.2434465+05	.1526208+05	.3702515+05
-.2921219-02	.0000000	-.3241782+05	-.2366545+05	-.1504829+05	.3902741+05

THETA ANGLE= .00000 RADIANS

.1112102+00	.6371875+01	.1000000+01	.1701700-02	.6248236+01	.2360000+01
-.5490077-03	.1355772-04	.0000000	-.4489093-03	-.7511462-03	.0000000
.0000000	.3171557+04	.0000000	.4101082+03	.0000000	.0000000
.4798791-03	.4101082+03	-.4028934+05	-.7097980+04	.0000000	.0000000
.4455190-01	.0000000	.2878483+05	.2050841+05	.0000000	.0000000
-.2115704-03	.0000000	.1393747+05	.1908562+05	.0000000	.1710288+05
.0000000	.0000000	-.4808098+05	-.2510085+05	.0000000	.4165285+05

THETA ANGLE= .78540 RADIANS

.1112102+00	.6371875+01	.1000000+01	.1701700-02	.6248236+01	.2360000+01
-.5212525-03	.6583465-04	-.2970801-04	-.6070259-03	-.2869294-03	.0000000
.6402261-03	.8203477+03	.3827372-03	-.1925703+03	-.6902260+03	.0000000
-.4332581-03	-.1925703+03	-.3747131+05	-.2833168+04	-.8763863+03	.0000000
.3696832-01	-.3579022+04	.1397723+05	.2274271+05	-.1048082+05	.0000000
-.3460753-03	.0000000	-.8203346+03	-.2329969+05	-.1166210+05	.3115567+05
.2665907-02	.0000000	-.3093501+05	-.2570068+05	.1091940+05	.3435329+05

THETA ANGLE= 1.57080 RADIANS

.1112102+00	.6371875+01	.1000000+01	.1701700-02	.6248236+01	.2360000+01
-.4450348-03	.1348992-03	-.3502153-04	-.7491372-03	.3128251-03	.0000000
.5873172-03	-.2158488+04	.3268536-03	-.8295257+03	-.8741561+03	.0000000
.3408956-03	-.8295257+03	-.3083155+05	.3384553+04	-.1033135+04	.0000000
.2405467-01	-.1988662+04	-.5579384+04	.2350125+05	-.8950517+04	.0000000
-.4824364-03	.0000000	-.1907476+05	.2675148+05	-.1007995+05	.4352680+05
.2049013-02	.0000000	-.7053678+04	-.2388322+05	.9204414+04	.2656806+05

THETA ANGLE= 2.35620 RADIANS

.1112102+00	.6371875+01	.1000000+01	.1701700-02	.6248236+01	.2360000+01
-.3557915-03	.1231516-03	-.1981987-04	-.5523822-03	.1758290-03	.0000000

.1903667+03	-.1322521+04	.7950441-04	-.3096052+03	-.5460158+03	.0000000
.2770867+03	-.3096052+03	-.2442314+05	.3834503+04	-.5846861+03	.0000000
.1877031+01	.7666111+03	-.2237007+04	.1770423+05	-.2177138+04	.0000000
-.3524140-03	.0000000	-.1275866+05	.2069714+05	-.2593129+04	.2958709+05
.2318420+03	.0000000	-.7938912+04	-.1744757+05	.2097632+04	.1556051+05

THETA ANGLE= 3.14160 RADIANS

.1112102+00	.6371875+01	.1000000-01	.1701700+02	.6248236+01	.2360000+01
-.3150111-03	.9461678-04	.1849630-09	-.3716351-03	-.9670048-04	.0000000
-.1011613-08	.1410495+03	-.1738513-09	.2445841+03	.5371847-02	.0000000
.2590195-03	.2445841+03	-.2183647+05	.2331574+04	.5456407-02	.0000000
.1881600-01	-.1734520-01	.5854243+04	.1338302+05	.4760721-02	.0000000
-.2205374-03	.0000000	-.2946103+04	.1540517+05	.7440650-02	.1706997+05
.2833526-08	.0000000	-.1555938+05	-.1342926+05	-.2816576-02	.1461124+05

THETA ANGLE= 3.92700 RADIANS

.1112102+00	.6371875+01	.1000000-01	.1701700-02	.6248236+01	.2360000+01
-.3557929-03	.1231523-03	.1982023-04	-.5523876-03	.1758364-03	.0000000
-.1903728-03	-.1322561+04	-.7950781-04	-.3096213+03	.5460249+03	.0000000
.2770875-03	-.3096213+03	-.2442323+05	-.3834539+04	.5846969+03	.0000000
.1877033-01	-.7665905+03	-.2237225+04	.1770436+05	.2177231+04	.0000000
-.3524179-03	.0000000	-.1275894+05	.2069730+05	.2593233+04	.2958748+05
-.2318633-03	.0000000	-.7938717+04	-.1744769+05	-.2097727+04	.1556067+05

THETA ANGLE= 4.71240 RADIANS

.1112102+00	.6371875+01	.1000000-01	.1701700-02	.6248236+01	.2360000+01
-.4450365-03	.1348986-03	.3502167-04	-.7491378-03	.3128203-03	.0000000
-.5873238-03	-.2158466+04	-.3268581-03	-.8295245+03	.8741582+03	.0000000
-.3408973-03	-.8295245+03	-.3083169+05	-.3384483+04	.1033139+04	.0000000
.2405486-01	.1988726+04	-.5579215+04	.2350130+05	.8950639+04	.0000000
-.4824363-03	.0000000	-.1907463+05	.2675151+05	.1008009+05	.4352682+05
-.2049048-02	.0000000	-.7053918+04	-.2388330+05	-.9204543+04	.2656821+05

THETA ANGLE= 5.49780 RADIANS

.1112102+00	.6371875+01	.1000000-01	.1701700-02	.6248236+01	.2360000+01
-.5212535-03	.6583304-04	.2970764-04	-.6070213-03	-.2869436-03	.0000000
-.6402200-03	.8204194+03	-.3827338-03	-.1925524+03	.6902169+03	.0000000
.4332597-03	-.1925524+03	-.3747141+05	-.2833302+04	.8763755+03	.0000000
.3696857-01	.3579001+04	.1397768+05	.2274265+05	.1048073+05	.0000000
-.3460714-03	.0000000	-.8198860+03	.2329957+05	.1166199+05	.3115528+05
-.2665885-02	.0000000	-.3093554+05	-.2570067+05	-.1091930+05	.3435348+05

THETA ANGLE= .00000 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.4879967-03	-.3186678-04	.0000000	-.5616194+03	-.6836403-03	.0000000
.0000000	.2252991+04	.0000000	.2621874+03	.0000000	.0000000
.9279437-03	.2621874+03	-.3645979+05	-.9548126+04	.0000000	.0000000
.4434202-01	.0000000	.2724572+05	.2390432+05	.0000000	.0000000
-.5043516-03	.0000000	.1390211+05	.2170575+05	.0000000	.1904344+05
.0000000	.0000000	-.4480024+05	-.2979738+05	.0000000	.3949703+05

THETA ANGLE= .78540 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.4647439-03	.1838383-04	-.4341729-04	-.6076932-03	-.2956326-03	.0000000
.6912242-03	.3189490+03	.3059164-03	-.4767928+03	-.1132013+04	.0000000
.8329093-03	-.4767928+03	-.3400370+05	-.5499165+04	-.1280809+04	.0000000
.3666243-01	-.3653760+04	.1427970+05	.2282513+05	-.8377174+04	.0000000
-.6956750-03	.0000000	.9748420+03	.2225882+05	-.9567250+04	.2737341+05
.2468827-02	.0000000	-.2979154+05	-.2691913+05	.8481819+04	.3203181+05

THETA ANGLE= 1.57080 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.3981610-03	.8766404-04	-.5409156-04	-.6092506-03	.2085640-03	.0000000
.6288821-03	-.2085802+04	.2802374-03	-.1220350+04	-.1459396+04	.0000000
.6480715-03	-.1220350+04	-.2807133+05	.5923479+03	-.1595701+04	.0000000
.2365676-01	-.1933799+04	-.2968203+04	.1942672+05	-.7673983+04	.0000000
-.8709707-03	.0000000	-.1509221+05	.2117895+05	-.8943147+04	.3515536+05
.1874434-02	.0000000	-.8697056+04	-.2067696+05	.7590858+04	.2227578+05

THETA ANGLE= 2.35620 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.3168060-03	.8335530-04	-.3307969-04	-.4557053-03	.1010644-03	.0000000
.1981502-03	-.1288168+04	.9039946-04	-.4924265+03	-.9318813+03	.0000000
.5263011-03	-.4924265+03	-.2213495+05	.1474565+04	-.9758509+03	.0000000
.1847802-01	.9189367+03	-.3396745+03	.1490683+05	-.2475487+04	.0000000
-.6409552-03	.0000000	-.9745141+04	.1668360+05	-.3080280+04	.2375623+05
.1820296-03	.0000000	-.9013294+04	-.1543397+05	.2253288+04	.1398456+05

THETA ANGLE= 3.14160 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.2787815-03	.6001735-04	.3219964-09	-.3466779-03	-.1226206-03	.0000000
-.9994745-09	-.1984474+02	-.4763064-09	.2400627+03	.9267222-02	.0000000
.4943343-03	.2400627+03	-.1967488+05	.3142536+03	.9498894-02	.0000000
.1862534-01	-.1941995-01	.6570629+04	.1270618+05	.1304311-01	.0000000
-.4269704-03	.0000000	-.1258427+04	.1382123+05	.1807599-01	.1449149+05

.3034530-08	.0000000	-.1541520+05	-.1355492+05	-.1002608-01	.1457437+05

THETA ANGLE= 3.92700 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.3168073-03	.8335590-04	.3308025-04	-.4557087-03	.1010705-03	.0000000
-.1981568-03	-.1288203+04	-.9040237-04	-.4924480+03	.9318964+03	.0000000
.5263024-03	-.4924480+03	-.2213504+05	.1474590+04	.9758674+03	.0000000
.1847804-01	-.9189166+03	-.3398591+03	.1490691+05	.2475567+04	.0000000
-.6409615-03	.0000000	-.9745376+04	.1668369+05	.3080373+04	.2375653+05
-.1820490-03	.0000000	-.9013132+04	-.1543404+05	-.2253367+04	.1398463+05

THETA ANGLE= 4.71240 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.3981626-03	.8766336-04	.5409171-04	-.6092521-03	.2085599-03	.0000000
-.6288893-03	-.2085785+04	-.2802405-03	-.1220350+04	.1459399+04	.0000000
.6480747-03	-.1220350+04	-.2807148+05	.5922753+03	.1595706+04	.0000000
.2365695-01	.1933866+04	-.2968051+04	.1942681+05	.7674070+04	.0000000
-.8709713-03	.0000000	-.1509210+05	.2117901+05	.8943242+04	.3515540+05
-.1874467-02	.0000000	-.8697272+04	-.2067708+05	-.7590950+04	.2227594+05

THETA ANGLE= 5.49780 RADIANS

.1214204+00	.6956876+01	.1000000-01	.1701700-02	.6819184+01	.2360000+01
-.4647448-03	.1838227-04	.4341668-04	-.6076921-03	-.2956445-03	.0000000
-.6912177-03	.3190078+03	-.3059135-03	-.4767710+03	.1131998+04	.0000000
.8329125-03	-.4767710+03	-.3400379+05	-.5499292+04	.1280792+04	.0000000
.3666268-01	.3653740+04	.1428010+05	.2282517+05	.8377095+04	.0000000
-.6956695-03	.0000000	.9752351+03	.2225882+05	.9567157+04	.2737316+05
-.2468808-02	.0000000	-.2979201+05	-.2691923+05	-.8481740+04	.3203202+05

THETA ANGLE= .00000 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.4356666-03	-.6626826-04	.0000000	-.6338075-03	-.6415482-03	.0000000
.0000000	.1373008+04	.0000000	-.1799217+03	.0000000	.0000000
.1350182-02	-.1799217+03	-.3310772+05	-.1131263+05	.0000000	.0000000
.4394322-01	.0000000	.2629911+05	.2608714+05	.0000000	.0000000
-.8495407-03	.0000000	-.1430273+05	.2330958+05	.0000000	.2035962+05
.0000000	.0000000	-.4236012+05	-.3289656+05	.0000000	.3851053+05

THETA ANGLE= .78540 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.4166630-03	-.1810301-04	-.5218670-04	-.5996948-03	-.3047224-03	.0000000

.7431427-03	-.1618694+03	.2609651-03	-.8126958+03	-.1412576+04	.0000000
.1204449-02	-.8126958+03	-.3099592+05	-.7480876+04	-.1539508+04	.0000000
.3615204-01	-.3650516+04	.1453609+05	.2261357+05	-.7146233+04	.0000000
-.1043069-02	.0000000	.2525526+04	.2119121+05	-.8350804+04	.2472114+05
.2305893-02	.0000000	-.2879325+05	-.2753094+05	.7046137+04	.3071226+05

THETA ANGLE= 1.57080 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.3586229-03	.5044462-04	-.6701380-04	-.5012227-03	.1350274+03	.0000000
.6675917-03	-.2016255+04	.2483688-03	-.1383734+04	-.1856103+04	.0000000
.9259750-03	-.1383734+04	-.2570438+05	-.1569397+04	-.1976907+04	.0000000
.2305368-01	-.1858703+04	-.1190612+04	.1623238+05	-.6801297+04	.0000000
-.1188926-02	.0000000	-.1217431+05	.1682176+05	-.8164552+04	.2891295+05
.1722061-02	.0000000	-.9609069+04	-.1815176+05	.6489207+04	.1933206+05

THETA ANGLE= 2.35620 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.2833843-03	.5152125-04	-.4258500-04	-.3799584-03	.4668480-04	.0000000
.2009756-03	-.1252751+04	.9028163-04	-.6019243+03	-.1212345+04	.0000000
.7512446-03	-.6019243+03	-.2013966+05	-.3802267+03	-.1256258+04	.0000000
.1803216-01	.1021893+04	.1003170+04	.1268631+05	-.2472260+04	.0000000
-.8803111-03	.0000000	-.7453061+04	.1350555+05	-.3195621+04	.1921567+05
.1294754-03	.0000000	-.9614445+04	-.1382778+05	.2130996+04	.1281882+05

THETA ANGLE= 3.14160 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.2471826-03	.3220583-04	-.4225094-09	-.3230542-03	-.1445788-03	.0000000
-.9230641-09	-.1697553+03	-.5717150-09	.1181396+03	.1218595-01	.0000000
-.7092548-03	.1181396+03	-.1775468+05	-.1270763+04	.1246403-01	.0000000
.1831780-01	-.2070639-01	.7160526+04	.1204787+05	.1565577-01	.0000000
-.6193714-03	.0000000	.1906964+03	.1244043+05	.2214696-01	.1234619+05
.3343574-08	.0000000	-.1523704+05	-.1351735+05	-.1158423-01	.1445412+05

THETA ANGLE= 3.92700 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.2833856-03	.5152173-04	-.4258570-04	-.3799604-03	.4668997-04	.0000000
-.2009826-03	-.1252781+04	-.9028421+04	-.6019457+03	.1212365+04	.0000000
-.7512464-03	-.6019457+03	-.2013974+05	-.3802095+03	.1256278+04	.0000000
.1803217-01	-.1021874+04	.1003006+04	.1268634+05	.2472331+04	.0000000
-.8803190-03	.0000000	-.7453273+04	.1350560+05	.3195706+04	.1921590+05
-.1294933-03	.0000000	-.9614304+04	-.1382781+05	-.2131063+04	.1281884+05

THETA ANGLE= 4.71240 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.3586243-03	.5044390-04	.6701394-04	-.5012250-03	.1350238-03	.0000000
-.6675997-03	-.2016249+04	-.2983713-03	-.1383737+04	.1856106+04	.0000000
.9259797-03	-.1383737+04	-.2570450+05	-.1569471+04	.1976911+04	.0000000
.2305387-01	.1858772+04	-.1190472+04	.1623248+05	.6801366+04	.0000000
-.1188928-02	.0000000	-.1217420+05	.1602184+05	.8164627+04	.2891300+05
-.1722093-02	.0000000	-.9609269+04	-.1815190+05	-.6489279+04	.1933224+05

THETA ANGLE= 5.49780 RADIANS

.1316306+00	.7541877+01	.1000000-01	.1701700-02	.7389420+01	.2360000+01
-.4166637-03	-.1810451-04	.5218600-04	-.5996961-03	-.3047328-03	.0000000
-.7431357-03	-.1618230+03	-.2609625-03	-.8126775+03	.1412557+04	.0000000
.1204454-02	-.8126775+03	-.3099599+05	-.7480997+04	.1539487+04	.0000000
.3615229-01	.3650496+04	.1453645+05	.2261369+05	.7146163+04	.0000000
-.1043064-02	.0000000	.2525885+04	.2119128+05	.8350719+04	.2472099+05
-.2305875-02	.0000000	-.2879367+05	-.2753111+05	-.7046069+04	.3071249+05

THETA ANGLE= .00000 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.3882280-03	-.9292493-04	.0000000	-.6771207-03	-.6136639-03	.0000000
.0000000	.5094520+03	.0000000	-.7875293+03	.0000000	.0000000
.1749854-02	-.7875293+03	-.3000246+05	-.1257958+05	.0000000	.0000000
.4333158-01	.0000000	.2564116+05	.2737885+05	.0000000	.0000000
-.1227518-02	.0000000	.1490972+05	.2416427+05	.0000000	.2111703+05
.0000000	.0000000	-.4033553+05	-.3482492+05	.0000000	.3788203+05

THETA ANGLE= .78540 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.3738997-03	-.4671786-04	-.5734985-04	-.5845535-03	-.3129424-03	.0000000
.7977660-03	-.6310620+03	.2352683-03	-.1180707+04	-.1577388+04	.0000000
.1551151-02	-.1180707+04	-.2826419+05	-.8960461+04	-.1691821+04	.0000000
.3544002-01	-.3587741+04	.1471380+05	.2215156+05	-.6442557+04	.0000000
-.1383761-02	.0000000	.3874483+04	.2006656+05	-.7657290+04	.2271196+05
.2162727-02	.0000000	-.2782718+05	-.2766017+05	.6223543+04	.2976458+05

THETA ANGLE= 1.57080 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.3244586-03	-.2070847-04	-.7566957-04	-.4141733-03	.8131668-04	.0000000
.7051336-03	-.1943356+04	.2259207-03	-.1423691+04	-.2122366+04	.0000000
.1177686-02	-.1423691+04	-.2362337+05	-.3258514+04	-.2232252+04	.0000000
.2228171-01	-.1768507+04	.5196033+02	.1362039+05	-.6186583+04	.0000000
-.1451203-02	.0000000	-.9953927+04	.1329228+05	-.7610531+04	.2412123+05

.1585068-02	.0000000	-.1006588+05	-.1605366+05	.5718791+04	.1719190+05

THETA ANGLE= 2.35620 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.2540174-03	.2572949-04	-.4966293-04	-.3188830-03	.6417202-05	.0000000
.1994448-03	-.1217566+04	.8423197-04	-.6679205+03	-.1424087+04	.0000000
.9544760-03	-.6679205+03	-.1835427+05	-.1849207+04	-.1465056+04	.0000000
.1745816-01	.1086676+04	.1963403+04	.1087138+05	-.2306597+04	.0000000
-.1080579-02	.0000000	-.5662107+04	.1092792+05	-.3105630+04	.1556563+05
.7890486-04	.0000000	-.9892363+04	-.1249508+05	-.1864057+04	.1186607+05

THETA ANGLE= 3.14160 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.2186894-03	.9531553-05	.5003003-09	-.3014058-03	-.1620171-03	.0000000
-.7860953-09	-.3200092+03	-.5511006-09	-.6235130+02	.1449081-01	.0000000
.9060279-03	-.6235130+02	-.1598775+05	-.2522716+04	.1475886-01	.0000000
.1790134-01	-.2138495-01	.7609234+04	.1142623+05	.1509127-01	.0000000
-.7987596-03	.0000000	.1422778+04	.1124027+05	.2251122-01	.1060073+05
.3670306-08	.0000000	-.1497172+05	-.1337816+05	-.1000372-01	.1424197+05

THETA ANGLE= 3.92700 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.2540186-03	.2572988-04	.4966371-04	-.3188839-03	.6421743-05	.0000000
-.1994521-03	-.1217591+04	-.8423431-04	-.6679389+03	.1424109+04	.0000000
.9544782-03	-.6679389+03	-.1835436+05	-.1849196+04	.1465080+04	.0000000
.1745817-01	-.1086657+04	.1963253+04	.1087138+05	.2306661+04	.0000000
-.1080588-02	.0000000	-.5662303+04	.1092793+05	.3105709+04	.1556582+05
-.7892132-04	.0000000	-.9892236+04	-.1249504+05	-.1864116+04	.1186606+05

THETA ANGLE= 4.71240 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.3244598-03	.2070772-04	.7566968-04	-.4141761-03	.8131336-04	.0000000
-.7051424-03	-.1943350+04	-.2259229-03	-.1423697+04	.2122369+04	.0000000
.1177693-02	-.1423697+04	-.2362347+05	-.3258588+04	.2232256+04	.0000000
.2228190-01	.1768575+04	.5209290+02	.1362051+05	.6186643+04	.0000000
-.1451206-02	.0000000	-.9953828+04	.1329230+05	.7610598+04	.2412129+05
-.1585099-02	.0000000	-.1006606+05	-.1605381+05	-.5718855+04	.1719209+05

THETA ANGLE= 5.49780 RADIANS

.1418408+00	.8126878+01	.1000000-01	.1701700-02	.7958885+01	.2360000+01
-.3739002-03	-.4671930-04	.5734906-04	-.5845566-03	-.3129516-03	.0000000

-.7977587-03	-.6310277+03	-.2352660-03	-.1180696+04	.1577366+04	.0000000
-.1551158-02	-.1180696+04	-.2826425+05	-.8960577+04	.1691797+04	.0000000
.3544028-01	.3587723+04	.1471414+05	.2215173+05	.6442493+04	.0000000
-.1383757-02	.0000000	.3874819+04	.2006669+05	.7657211+04	.2271189+05
-.2162710-02	.0000000	-.2782757+05	-.2766040+05	-.6223484+04	.2976483+05

THETA ANGLE= .00000 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.3432272-03	-.1140186-03	.0000000	-.6980976-03	-.5935844-03	.0000000
.0000000	-.3528259+03	.0000000	-.1495543+04	.0000000	.0000000
.2128487-02	-.1495543+04	-.2699478+05	-.1347147+05	.0000000	.0000000
.4249284-01	.0000000	.2509745+05	.2795942+05	.0000000	.0000000
-.1623742-02	.0000000	.1559843+05	.2441179+05	.0000000	.2141170+05
.0000000	.0000000	-.3847536+05	-.3582828+05	.0000000	.3722248+05

THETA ANGLE= .78540 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.3344373-03	-.6950832-04	-.5962507-04	-.5630471-03	-.3196510-03	.0000000
.8565258-03	-.1095443+04	.2213295-03	-.1571318+04	-.1651287+04	.0000000
.1874881-02	-.1571318+04	-.2569000+05	-.1005919+05	-.1758940+04	.0000000
.3453160-01	-.3477467+04	.1479620+05	.2146133+05	-.6060857+04	.0000000
-.1713895-02	.0000000	.5054009+04	.1885742+05	-.7274533+04	.2108545+05
.2030583-02	.0000000	-.2682520+05	-.2738216+05	.5783906+04	.2889987+05

THETA ANGLE= 1.57080 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.2943781-03	-.3285034-05	-.8120621-04	-.3417034-03	.4093875-04	.0000000
.7427238-03	-.1863949+04	.2095737-03	-.1394221+04	-.2293648+04	.0000000
-.1405406-02	-.1394221+04	-.2175884+05	-.4584348+04	-.2395583+04	.0000000
.2137003-01	-.1666647+04	.9379636+03	.1141619+05	-.5738940+04	.0000000
-.1667866-02	.0000000	-.8209400+04	.1035587+05	-.7197503+04	.2037317+05
.1459064-02	.0000000	-.1023029+05	-.1424091+05	.5167348+04	.1555243+05

THETA ANGLE= 2.35620 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.2276772-03	.4624889-05	-.5521766-04	-.2684230-03	-.2378586-04	.0000000
.1938457-03	-.1183837+04	.7505278-04	-.7079627+03	-.1592416+04	.0000000
-.1137857-02	-.7079627+03	-.1672297+05	-.3017153+04	-.1628921+04	.0000000
.1677653-01	.1120453+04	.2651801+04	.9350913+04	-.2055235+04	.0000000
-.1248947-02	.0000000	-.4229283+04	.8795066+04	-.2904278+04	.1255951+05
.3285125-04	.0000000	-.9942730+04	-.1135198+05	.1523836+04	.1103729+05

THETA ANGLE= 3.14160 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.1922461-03	-.9177956-05	.5651801-09	-.2814355-03	-.1751643-03	.0000000
-.5891028-09	-.4778487+03	-.4658270-09	-.2745818+03	.1644624-01	.0000000
.1086178-02	-.2745818+03	-.1431358+05	-.3512504+04	.1667281-01	.0000000
.1738333-01	-.2157160-01	.7922542+04	.1083266+05	.1275614-01	.0000000
-.9662117-03	.0000000	.2469716+04	.1018142+05	.2080665-01	.9198673+04
.3964050-08	.0000000	-.1459982+05	-.1315812+05	-.6677145-02	.1393502+05

THETA ANGLE= 3.92700 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.2276784-03	.4625195-05	.5521850-04	-.2684230-03	-.2378178-04	.0000000
-.1938534-03	-.1183858+04	-.7505495-04	-.7079765+03	.1592440+04	.0000000
.1137860-02	-.7079765+03	-.1672306+05	-.3017147+04	.1628946+04	.0000000
.1677653-01	-.1120435+04	.2651662+04	.9350885+04	.2055295+04	.0000000
-.1248956-02	.0000000	-.4229468+04	.8795038+04	.2904352+04	.1255967+05
-.3286642-04	.0000000	-.9942614+04	-.1135194+05	-.1523890+04	.1103725+05

THETA ANGLE= 4.71240 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.2943792-03	-.3285807-05	.8120627-04	-.3417065-03	.4093567-04	.0000000
-.7427335-03	-.1863948+04	-.2095759-03	-.1394230+04	.2293649+04	.0000000
.1405414-02	-.1394230+04	-.2175893+05	-.4584421+04	.2395585+04	.0000000
.2137022-01	.1666715+04	.9380898+03	.1141631+05	.5738999+04	.0000000
-.1667871-02	.0000000	-.8209304+04	.1035598+05	.7197568+04	.2037325+05
-.1459093-02	.0000000	-.1023047+05	-.1424108+05	-.5167411+04	.1555263+05

THETA ANGLE= 5.49780 RADIANS

.1520510+00	.8711878+01	.1000000-01	.1701700-02	.8527521+01	.2360000+01
-.3344377-03	-.6950971-04	.5962423-04	-.5630515-03	-.3196594-03	.0000000
-.8565181-03	-.1095422+04	-.2213273-03	-.1571317+04	.1651263+04	.0000000
.1874890-02	-.1571317+04	-.2569005+05	-.1005930+05	.1758915+04	.0000000
.3453186-01	.3477450+04	.1479652+05	.2146154+05	.6060797+04	.0000000
-.1713893-02	.0000000	.5054330+04	.1885760+05	.7274458+04	.2108544+05
-.2030568-02	.0000000	-.2682556+05	-.2738243+05	-.5783852+04	.2890014+05

THETA ANGLE= .00000 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2990485-03	-.1309864-03	.0000000	-.7004568-03	-.5775136-03	.0000000
.0000000	-.1224723+04	.0000000	-.2270389+04	.0000000	.0000000
.2486482-02	-.2270389+04	-.2398687+05	-.1407121+05	.0000000	.0000000
.4142017-01	.0000000	.2456350+05	.2793016+05	.0000000	.0000000
-.2026542-02	.0000000	.1629776+05	.2412613+05	.0000000	.2131866+05

.0000000	.0000000	-.3662561+05	-.3605089+05	.0000000	.3634166+05

THETA ANGLE= .78540 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2969494-03	-.8787266-04	-.5939756-04	-.5355353-03	-.3245238-03	.0000000
.9206520-03	-.1560383+04	.2144924-03	-.1980178+04	-.1647901+04	.0000000
.2176591-02	-.1980178+04	-.2319614+05	-.1086061+05	-.1752228+04	.0000000
.3343410-01	-.3327797+04	.1477465+05	.2055296+05	-.5873631+04	.0000000
-.2029930-02	.0000000	.6087515+04	.1753927+05	-.7069995+04	.1969436+05
.1904134-02	.0000000	-.2574526+05	-.2674318+05	.5585056+04	.2798365+05

THETA ANGLE= 1.57080 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2675238-03	-.2276255-04	-.8434859-04	-.2799094-03	.9820560-05	.0000000
.7812806-03	-.1776623+04	.1971851-03	-.1324637+04	-.2392374+04	.0000000
-.1610765-02	-.1324637+04	-.2006563+05	-.5624715+04	-.2488283+04	.0000000
.2034295-01	-.1555475+04	.1578725+04	.9513746+04	-.5399690+04	.0000000
-.1846085-02	.0000000	-.6801661+04	.7865583+04	-.6871317+04	.1741476+05
.1341197-02	.0000000	-.1020311+05	-.1263229+05	.4762603+04	.1424207+05

THETA ANGLE= 2.35620 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2036511-03	-.1277229-04	-.5988914-04	-.2258498-03	-.4662392-04	.0000000
.1842473-03	-.1152661+04	.6436969-04	-.7328665+03	-.1735421+04	.0000000
-.1302777-02	-.7328665+03	-.1520766+05	-.3945818+04	-.1766730+04	.0000000
.1600421-01	.1128004+04	.3142089+04	.8049987+04	-.1762691+04	.0000000
-.1390683-02	.0000000	-.3059025+04	.7000109+04	-.2647520+04	.1003996+05
-.7389004-05	.0000000	-.9828824+04	-.1034402+05	.1150292+04	.1029099+05

THETA ANGLE= 3.14160 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.1671054-03	-.2477810-04	-.6243581-09	-.2624939-03	-.1845006-03	.0000000
-.3302998-09	-.6481266+03	-.3463526-09	-.5064273+03	.1825010-01	.0000000
-.1250723-02	-.5064273+03	-.1268950+05	-.4292189+04	-.1841856-01	.0000000
.1677053-01	-.2134387-01	.8112449+04	.1024821+05	.9484475-02	.0000000
-.1122515-02	.0000000	-.3362445+04	.9221432+04	-.1802188-01	.8082963+04
.4197036-08	.0000000	-.1411626+05	-.1285888+05	-.2412927-02	.1353146+05

THETA ANGLE= 3.92700 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2036523-03	-.1277203-04	-.5989002-04	-.2258491-03	-.4662022-04	.0000000

-.1842555-03	-.1152676+04	-.6437174-04	-.7328748+03	.1735446+04	.0000000
.1302780-02	-.7328748+03	-.1520775+05	-.3945808+04	.1766755+04	.0000000
.1600420-01	-.1127988+04	.3141958+04	.8049938+04	.1762747+04	.0000000
-.1390691-02	.0000000	-.3059202+04	.7000057+04	.2647592+04	.1004009+05
.7375071-05	.0000000	-.9828718+04	-.1034396+05	-.1150341+04	.1029093+05

THETA ANGLE= 4.71240 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2675248-03	-.2276333-04	.8434859-04	-.2799126-03	.9857674-05	.0000000
-.7812914-03	-.1776627+04	-.1971873-03	-.1324650+04	.2392373+04	.0000000
.1610774-02	-.1324650+04	-.2006571+05	-.5624786+04	.2488283+04	.0000000
.2034313-01	.1555541+04	.1578846+04	.9513876+04	.5399750+04	.0000000
-.1846092-02	.0000000	-.6801566+04	-.7865693+04	.6871382+04	.1741485+05
-.1341225-02	.0000000	-.1020327+05	-.1263246+05	-.4762668+04	.1424228+05

THETA ANGLE= 5.49780 RADIANS

.1622611+00	.9296879+01	.1000000-01	.1701700-02	.9095268+01	.2360000+01
-.2969496-03	-.8787902-04	.5939668-04	-.5355406-03	-.3245315-03	.0000000
-.9206439-03	-.1560374+04	-.2144903-03	-.1980188+04	.1647876+04	.0000000
.2176601-02	-.1980188+04	-.2319617+05	-.1086071+05	.1752202+04	.0000000
.3343436-01	.3327781+04	.1477495+05	.2055320+05	.5873575+04	.0000000
-.2029930-02	.0000000	.6087826+04	.1753948+05	.7069923+04	.1969439+05
-.1904120-02	.0000000	-.2574560+05	-.2674348+05	-.5585006+04	.2798391+05

THETA ANGLE= .00000 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.2695107-03	-.1405140-03	.0000000	-.6927632-03	-.5678394-03	.0000000
.0000000	-.1815463+04	.0000000	-.2815131+04	.0000000	.0000000
.2713539-02	-.2815131+04	-.2194899+05	-.1433819+05	.0000000	.0000000
.4057496-01	.0000000	.2417968+05	.2760058+05	.0000000	.0000000
-.2293726-02	.0000000	.1674779+05	.2365796+05	.0000000	.2107057+05
.0000000	.0000000	-.3534863+05	-.3580896+05	.0000000	.3558103+05

THETA ANGLE= .78540 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.2726094-03	-.9815319-04	-.5795985-04	-.5139207-03	-.3266700-03	.0000000
.9669370-03	-.1872832+04	.2123473-03	-.2262008+04	-.1606531+04	.0000000
.2365693-02	-.2262008+04	-.2155270+05	-.1125979+05	-.1709816+04	.0000000
.3260191-01	-.3208973+04	.1470014+05	.1982779+05	-.5814891+04	.0000000
-.2231101-02	.0000000	.6703622+04	.1658892+05	-.6988745+04	.1885345+05
.1821371-02	.0000000	-.2496862+05	-.2613111+05	.5539749+04	.2731073+05

THETA ANGLE= 1.57080 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.2511215-03	-.3368571-04	-.8535446-04	-.2433931-03	-.7013716-05	.0000000
.8078852-03	-.1713734+04	.1903997-03	-.1264444+04	-.2425348+04	.0000000
-.1735880-02	-.1264444+04	-.1901707+05	-.6188362+04	-.2517957+04	.0000000
.1960445-01	-.1477014+04	.1906339+04	.8379321+04	-.5213879+04	.0000000
-.1946249-02	.0000000	-.6004427+04	.6404660+04	-.6683721+04	.1579701+05
.1266200-02	.0000000	-.1011174+05	-.1164903+05	.4549860+04	.1350033+05

THETA ANGLE= 2.35620 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.1886657-03	-.2267609-04	-.6274934-04	-.2008871-03	-.5869712-04	.0000000
.1755872-03	-.1133769+04	.5691876-04	-.7445935+03	-.1823421+04	.0000000
-.1403001-02	-.7445935+03	-.1424857+05	-.4455180+04	-.1851106+04	.0000000
.1544609-01	.1120141+04	.3384459+04	.7278170+04	-.1558656+04	.0000000
-.1472373-02	.0000000	-.2391530+04	.5952814+04	-.2463470+04	.8578916+04
-.3068768-04	.0000000	-.9683527+04	-.9728390+04	.8947367+03	.9828978+04

THETA ANGLE= 3.14160 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.1507970-03	-.3377290-04	.6633896-09	-.2500652-03	-.1888653-03	.0000000
-.1217396-09	-.7702762+03	-.2573703-09	-.6691824+03	.1944481-01	.0000000
.1352088-02	-.6691824+03	-.1161993+05	-.4715008+04	.1956999-01	.0000000
.1631252-01	-.2098897-01	.8176766+04	.9852656+04	.7047795-02	.0000000
-.1220727-02	.0000000	.3885151+04	.8616152+04	.1588479-01	.7473782+04
.4311347-08	.0000000	-.1373213+05	-.1261192+05	.6999448-03	.1320770+05

THETA ANGLE= 3.92700 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.1886669-03	-.2267585-04	.6275023-04	-.2008860-03	-.5869364-04	.0000000
-.1755956-03	-.1133781+04	-.5692074-04	-.7445976+03	.1823446+04	.0000000
.1403004-02	-.7445976+03	-.1424865+05	-.4455181+04	.1851132+04	.0000000
.1544609-01	-.1120125+04	.3384332+04	.7278110+04	.1558710+04	.0000000
-.1472381-02	.0000000	-.2391703+04	.5952749+04	.2463540+04	.8579030+04
.3067454-04	.0000000	-.9683428+04	-.9728326+04	-.8947840+03	.9828910+04

THETA ANGLE= 4.71240 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.2511223-03	-.3368649-04	.8535439-04	-.2433969-03	-.7016499-05	.0000000
-.8078968-03	-.1713741+04	-.1904020-03	-.1264460+04	.2425345+04	.0000000
-.1735890-02	-.1264460+04	-.1901715+05	-.6188433+04	.2517954+04	.0000000
.1960463-01	.1477078+04	.1906457+04	.8379451+04	.5213942+04	.0000000
-.1946257-02	.0000000	-.6004332+04	.6404770+04	.6683788+04	.1579710+05

-.1266227-02	.0000000	-.1011190+05	-.1164920+05	-.4549928+04	.1350053+05

THETA ANGLE= 5.49780 RADIANS

.1690679+00	.9686879+01	.1000000-01	.1701700-02	.9473243+01	.2360000+01
-.2726094-03	-.9815452-04	-.5795896-04	-.5139264-03	-.3266774-03	.0000000
-.9669286-03	-.1872831+04	-.2123454-03	-.2262026+04	.1606506+04	.0000000
-.2365704-02	-.2262026+04	-.2155272+05	-.1125988+05	-.1709789+04	.0000000
.3260217-01	.3208957+04	.1470044+05	.1982804+05	.5814837+04	.0000000
-.2231104-02	.0000000	.6703928+04	.1658914+05	.6988675+04	.1885351+05
-.1821358-02	.0000000	-.2496895+05	-.2613142+05	-.5539701+04	.2731099+05

THETA ANGLE= .00000 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.2647038-03	-.1419416-03	.0000000	-.6908558-03	-.5663094-03	.0000000
.0000000	-.1911957+04	.0000000	-.2905143+04	.0000000	.0000000
.2749399-02	-.2905143+04	-.2161554+05	-.1437257+05	.0000000	.0000000
.4042796-01	.0000000	.2411425+05	.2752481+05	.0000000	.0000000
-.2336635-02	.0000000	.1681859+05	.2356177+05	.0000000	.2101776+05
.0000000	.0000000	-.3513685+05	-.3574191+05	.0000000	.3544325+05

THETA ANGLE= .78540 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.2687027-03	-.9968899-04	-.5763362-04	-.5101765-03	-.3269321-03	.0000000
.9747202-03	-.1923683+04	.2121244-03	-.2308302+04	-.1597016+04	.0000000
.2395395-02	-.2308302+04	-.2128724+05	-.1131543+05	-.1700192+04	.0000000
.3245992-01	-.3188419+04	.1468348+05	.1970142+05	-.5808786+04	.0000000
-.2262860-02	.0000000	.6798158+04	.1642921+05	-.6978089+04	.1872236+05
.1808037-02	.0000000	-.2483819+05	-.2601855+05	.5537249+04	.2719615+05

THETA ANGLE= 1.57080 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.2485687-03	-.3531641-04	-.8544442-04	-.2377894-03	-.9504664-05	.0000000
.8122744-03	-.1703199+04	.1893847-03	-.1253949+04	-.2428495+04	.0000000
.1755270-02	-.1253949+04	-.1885286+05	-.6270973+04	-.2520610+04	.0000000
.1948135-01	-.1464020+04	.1953243+04	.8204568+04	-.5186087+04	.0000000
-.1961171-02	.0000000	-.5084316+04	.6181397+04	-.6654905+04	.1555865+05
.1254297-02	.0000000	-.1009268+05	-.1149578+05	.4518795+04	.1338845+05

THETA ANGLE= 2.35620 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.1863080-03	-.2416644-04	-.6320278-04	-.1970663-03	-.6045045-04	.0000000

.1740113-03	-.1130875+04	.5570642-04	-.7462560+03	-.1837387+04	.0000000
.1418513-02	-.7462560+03	-.1409667+05	-.4530319+04	-.1864482+04	.0000000
.1535283-01	.1117963+04	.3418318+04	.7159389+04	-.1525457+04	.0000000
-.1484714-02	.0000000	-.2290692+04	.5793016+04	-.2433374+04	.8357048+04
-.3418708-04	.0000000	-.9655641+04	-.9632269+04	.8533047+03	.9756571+04

THETA ANGLE= 3.14160 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.1481808-03	-.3513622-04	.6697892-09	-.2480495-03	-.1894443-03	.0000000
-.8516593-10	-.7907632+03	-.2426203-09	-.6960742+03	.1964077-01	.0000000
.1367879-02	-.6960742+03	-.1144659+05	-.4776963+04	.1975878-01	.0000000
.1623483-01	-.2091731-01	.8182784+04	.9787624+04	.6643883-02	.0000000
-.1236174-02	.0000000	.3964871+04	.8519842+04	.1552967-01	.7384296+04
.4326571-08	.0000000	-.1366537+05	-.1256812+05	.1215065-02	.1315112+05

THETA ANGLE= 3.92700 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.1863093-03	-.2416622-04	.6320367-04	-.1970652-03	-.6044700-04	.0000000
-.1740198-03	-.1130886+04	-.5570839-04	-.7462594+03	.1837412+04	.0000000
-.1418516-02	-.7462594+03	-.1409676+05	-.4530320+04	.1864508+04	.0000000
.1535283-01	-.1117948+04	.3418192+04	.7159328+04	.1525511+04	.0000000
-.1484722-02	.0000000	-.2290865+04	.5792950+04	.2433443+04	.8357160+04
.3417405-04	.0000000	-.9655542+04	-.9632204+04	-.8533516+03	.9756501+04

THETA ANGLE= 4.71240 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.2485695-03	-.3531720-04	.8544433-04	-.2377929-03	-.9507434-05	.0000000
-.8122862-03	-.1703208+04	-.1893870-03	-.1253966+04	.2428492+04	.0000000
-.1755280-02	-.1253966+04	-.1885293+05	-.6271044+04	.2520608+04	.0000000
.1948153-01	.1464084+04	.1953360+04	.8204698+04	.5186150+04	.0000000
-.1961179-02	.0000000	-.5884222+04	-.6181508+04	.6654972+04	.1555874+05
-.1254324-02	.0000000	-.1009284+05	-.1149595+05	-.4518864+04	.1338865+05

THETA ANGLE= 5.49780 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9534376+01	.2360000+01
-.2687027-03	-.9969032-04	.5763273-04	-.5101822-03	-.3269395-03	.0000000
-.9747117-03	-.1923683+04	-.2121224-03	-.2308322+04	.1596991+04	.0000000
.2395407-02	-.2308322+04	-.2128726+05	-.1131553+05	.1700166+04	.0000000
.3246018-01	.3188404+04	.1468377+05	.1970167+05	.5808732+04	.0000000
-.2262863-02	.0000000	.6798464+04	.1642943+05	.6978020+04	.1872241+05
-.1808024-02	.0000000	-.2483851+05	-.2601886+05	-.5537202+04	.2719641+05

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO.1

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.1701696+00	.3403392+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.7854000+00	.7854000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04 .1000000+04

PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
EPSILON THETA	EPSILON PHI	GAMMA PHI THETA	K PHI	K THETA	N TEMPERATURE THETA
U	Q PHI	K PHI THETA	J PHI STAR	T PHI THETA	N TEMPERATURE PHI
V	J PHI	N THETA	N PHI	N PHI THETA	M TEMPERATURE THETA
W	Q THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE PHI
OMEGA THETA	TAU ZETA PHI = Q/T	SIGMA THETA IN	SIGMA PHI IN	TAU PHI THETA IN	SIGMA F IN
OMEGA PHI	TAU ZETA THETA = Q/T	SIGMA THETA OUT	SIGMA PHI OUT	TAU PHI THETA OUT	SIGMA F OUT

THETA ANGLE= .00000 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.2763848-03	-.6975092-03	.0000000	-.1168487-02	-.5655162-03	.0000000
.0000000	-.1804460+04	.0000000	-.2902559+04	.0000000	.0000000
.2632567-02	-.2902559+04	-.1330710+05	-.1435982+05	.0000000	.0000000
.4042796-01	.0000000	.2678134+05	.2678242+05	.0000000	.0000000
-.2336635-02	.0000000	.1140163+05	.1140165+05	.0000000	.0000000
.0000000	.0000000	-.1549400+05	-.2752954+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.2800959-03	-.4852593-03	-.6606890-04	-.9177132-03	-.3265585-03	.0000000
.9755858-03	-.1873256+04	.2116728-03	-.2306250+04	-.1594182+04	.0000000
.2282253-02	-.2306250+04	-.1079255+05	-.1130539+05	-.1708641+04	.0000000
.3245993-01	-.3444517+04	.1911758+05	.1911869+05	-.6449740+04	.0000000
-.2262859-02	.0000000	-.1574900+03	.1452499+05	.0000000	.0000000
.1806418-02	.0000000	-.1337993+05	-.1998690+05	-.2966793+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.2585498-03	-.1660837-03	-.1207186-03	-.5134594-03	-.9668801-05	.0000000
.8129958-03	-.1738587+04	.1887351-03	-.1252835+04	-.2424187+04	.0000000
-.1657212-02	-.1252835+04	-.6496618+04	-.6265411+04	-.2527887+04	.0000000
.1948135-01	-.2082227+04	.7883025+04	.7884022+04	-.5843536+04	.0000000
-.1961170-02	.0000000	-.5995446+04	.8950287+04	.0000000	.0000000
.1253171-02	.0000000	-.9468831+04	-.8416655+04	-.1037145+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.1938630-03	-.1201911-03	-.1046525-03	-.3936997-03	-.6048018-04	.0000000
.1741659-03	-.1178586+04	.5523932-04	-.7455928+03	-.1834128+04	.0000000
-.1344278-02	-.7455928+03	-.4710511+04	-.4526301+04	-.1866324+04	.0000000
.1535283-01	.4997887+03	.6926076+04	.6926723+04	-.1814277+04	.0000000
-.1484713-02	.0000000	-.1125104+04	.5328875+04	.0000000	.0000000
-.3415941-04	.0000000	-.7244476+04	-.6235728+04	-.1170058+04	.0000000

THETA ANGLE= 3.14160 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.1544338-03	-.1812230-03	.1172339-08	-.4274187-03	-.1892215-03	.0000000
-.8524170-10	-.8220546+03	-.2377255-09	-.6954550+03	.1960594-01	.0000000
.1306070-02	-.6954550+03	-.4705784+04	-.4772727+04	.1976372-01	.0000000
.1623483-01	-.1370321-01	.9539874+04	.9540306+04	.8890784-02	.0000000
-.1236174-02	.0000000	.4214763+04	.4214737+04	.0000000	.0000000
.4322732-08	.0000000	-.6817154+04	-.8082377+04	.1405992-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.1938643-03	-.1201898-03	.1046538-03	-.3936994-03	-.6047673-04	.0000000
-.1741743-03	-.1178597+04	-.5524128-04	-.7455962+03	.1834153+04	.0000000
.1344280-02	-.7455962+03	-.4710519+04	-.4526303+04	.1866351+04	.0000000
.1535283-01	-.4997671+03	.6926014+04	.6926662+04	.1814337+04	.0000000
-.1484722-02	.0000000	.5328852+04	-.1125192+04	.0000000	.0000000
.3414640-04	.0000000	-.7244496+04	-.6235691+04	.1170069+04	.0000000

THETA ANGLE= 4.71240 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.2585507-03	-.1660875-03	.1207181-03	-.5134648-03	-.9671567-05	.0000000
-.8130075-03	-.1738594+04	-.1887374-03	-.1252851+04	.2424183+04	.0000000
-.1657222-02	-.1252851+04	-.6496681+04	-.6265482+04	.2527885+04	.0000000
.1948153-01	.2082285+04	.7883152+04	.7884148+04	.5843604+04	.0000000
-.1961178-02	.0000000	.8950334+04	-.5995388+04	.0000000	.0000000

-.1253198-02	.0000000	-.9468895+04	-.8416797+04	.1037132+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.1701696+00	.9749999+01	.1000000-01	.1701700-02	.9542844+01	.1000000+00
-.2800959-03	-.4852660-03	.6606765-04	-.9177212-03	-.3265659-03	.0000000
-.9755773-03	-.1873255+04	-.2116708-03	-.2306269+04	.1594157+04	.0000000
.2282264-02	-.2306269+04	-.1079263+05	-.1130549+05	.1708615+04	.0000000
.3246018-01	.3444496+04	.1911782+05	.1911893+05	.6449679+04	.0000000
-.2262863-02	.0000000	.1452500+05	-.1572392+03	.0000000	.0000000
-.1806405-02	.0000000	-.1338000+05	-.1998714+05	.2966686+03	.0000000

THETA ANGLE= .00000 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.2620244-03	-.6960020-03	.0000000	-.1113358-02	-.5770698-03	.0000000
.0000000	-.2760200+04	.0000000	-.3849565+04	.0000000	.0000000
.2636876-02	-.3849565+04	-.1308863+05	-.1417348+05	.0000000	.0000000
.3886592-01	.0000000	.2609547+05	.2609641+05	.0000000	.0000000
-.2994433-02	.0000000	.1098602+05	.1098603+05	.0000000	.0000000
.0000000	.0000000	-.1503747+05	-.2722763+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.2654422-03	-.4865037-03	-.7377278-04	-.8326839-03	-.3492707-03	.0000000
.1036619-02	-.2423584+04	.2200836-03	-.2831297+04	-.1739920+04	.0000000
.2326993-02	-.2831297+04	-.1063987+05	-.1119246+05	-.1859062+04	.0000000
.3098708-01	-.3487053+04	.1812282+05	.1812370+05	-.6713637+04	.0000000
-.2767015-02	.0000000	-.1258984+04	.1415924+05	.0000000	.0000000
.1680872-02	.0000000	-.1294762+05	-.1968269+05	-.3719508+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.2425448-03	-.1749363-03	-.1194615-03	-.3994751-03	-.4383681-04	.0000000
.8294237-03	-.1747696+04	.1883140+03	-.1234926+04	-.2402752+04	.0000000
.1752067-02	-.1234926+04	-.6464573+04	-.6295510+04	-.2506195+04	.0000000
.1825700-01	-.1954952+04	.6593896+04	.6594593+04	-.5829014+04	.0000000
-.2223396-02	.0000000	-.7053903+04	.7828826+04	.0000000	.0000000
.1143800-02	.0000000	-.9059540+04	-.8258423+04	-.1022483+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.1755967-03	-.1380166-03	-.9517083-04	-.3118964-03	-.8420734-04	.0000000

.1363661-03	-.1265237+04	.4623302-04	-.8575243+03	-.1658079+04	.0000000
.1422080-02	-.8575243+03	-.4745069+04	-.4651088+04	-.1685228+04	.0000000
.1442390-01	.7223158+03	.5980929+04	.5981363+04	-.1529846+04	.0000000
-.1687439-02	.0000000	-.1577211+04	.4051924+04	.0000000	.0000000
-.6328905-04	.0000000	-.6808084+04	-.6437804+04	-.1074053+04	.0000000

THETA ANGLE= 3.14160 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.1349643-03	-.2031648-03	.1036616-08	-.3768516-03	-.2022107-03	.0000000
.5211866-09	-.1122051+04	-.1064510-09	-.1058221+04	.1708012-01	.0000000
.1357137-02	-.1058221+04	-.4752106+04	-.4922578+04	.1716439-01	.0000000
.1544200-01	-.1659049-01	.8924170+04	.8924474+04	.4748683-02	.0000000
-.1467686-02	.0000000	.3614002+04	.3613976+04	.0000000	.0000000
.4418084-08	.0000000	-.6354855+04	-.8496467+04	.1269157-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.1755980-03	-.1380151-03	.9517207-04	-.3118952-03	-.8420421-04	.0000000
-.1363747-03	-.1265242+04	-.4623497-04	-.8575210+03	.1658104+04	.0000000
.1422084-02	-.8575210+03	-.4745074+04	-.4651089+04	.1685254+04	.0000000
.1442389-01	-.7222955+03	.5980858+04	.5981292+04	.1529906+04	.0000000
-.1687447-02	.0000000	.4051909+04	-.1577322+04	.0000000	.0000000
.6327717-04	.0000000	-.6808105+04	-.6437760+04	.1074063+04	.0000000

THETA ANGLE= 4.71240 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.2425458-03	-.1749399-03	.1194612-03	-.3994805-03	-.4383966-04	.0000000
-.8294369-03	-.1747708+04	-.1883165-03	-.1234946+04	.2402753+04	.0000000
.1752076-02	-.1234946+04	-.6464634+04	-.6295578+04	.2506198+04	.0000000
.1825718-01	.1955014+04	.6594022+04	.6594719+04	.5829091+04	.0000000
-.2223407-02	.0000000	.7828905+04	-.7063875+04	.0000000	.0000000
-.1143826-02	.0000000	-.9059604+04	-.8258560+04	.1022473+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.1803798+00	.1033500+02	.1000000-01	.1701700-02	.1010937+02	.1000000+00
-.2654422-03	-.4865103-03	.7377154-04	-.8326928-03	-.3492777-03	.0000000
-.1036610-02	-.2423595+04	-.2200816-03	-.2831330+04	.1739895+04	.0000000
.2327003-02	-.2831330+04	-.1063995+05	-.1119255+05	.1859036+04	.0000000
.3098733-01	.3487032+04	.1812306+05	.1812395+05	.6713577+04	.0000000
-.2767023-02	.0000000	.1415928+05	-.1258738+04	.0000000	.0000000
-.1680861-02	.0000000	-.1294768+05	-.1968292+05	.3719402+03	.0000000

THETA ANGLE= .00000 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.2431940-03	-.6957442-03	.0000000	-.1030485-02	-.5825764+03	.0000000
.0000000	-.3695255+04	.0000000	-.4782573+04	.0000000	.0000000
.2623848-02	-.4782573+04	-.1285935+05	-.1399064+05	.0000000	.0000000
.3693614-01	.0000000	.2486409+05	.2486486+05	.0000000	.0000000
-.3612453-02	.0000000	.1011185+05	.1011185+05	.0000000	.0000000
.0000000	.0000000	-.1441282+05	-.2684635+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.2466338-03	-.4902743-03	-.7947609-04	-.7347825-03	-.3645955-03	.0000000
.1086625-02	-.2964246+04	.2295286-03	-.3348713+04	-.1855753+04	.0000000
.2353784-02	-.3348713+04	-.1048175+05	-.1109078+05	-.1980076+04	.0000000
.2923858-01	-.3394899+04	.1680052+05	.1680118+05	-.7005562+04	.0000000
-.3218552-02	.0000000	-.2640956+04	.1351505+05	.0000000	.0000000
.1550256-02	.0000000	-.1237012+05	-.1938660+05	-.4196297+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.2238963-03	-.1866403-03	-.1180572-03	-.2926528-03	-.6944379-04	.0000000
.8414105-03	-.1757385+04	.1875548-03	-.1213787+04	-.2378097+04	.0000000
-.1827732-02	-.1213787+04	-.6431264+04	-.6338083+04	-.2481099+04	.0000000
.1689935-01	-.1786887+04	.5281652+04	.5282082+04	-.5804131+04	.0000000
-.2422206-02	.0000000	-.8124116+04	.6670916+04	.0000000	.0000000
.1034823-02	.0000000	-.8563181+04	-.8189805+04	-.1006828+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.1572589-03	-.1551204-03	-.8748169-04	-.2348487-03	-.1011161-03	.0000000
.1033123-03	-.1339580+04	.3571447-04	-.9551141+03	-.1507379+04	.0000000
-.1479790-02	-.9551141+03	-.4770150+04	-.4764773+04	-.1528723+04	.0000000
.1339089-01	.8678419+03	.5003606+04	.5003606+04	-.1202733+04	.0000000
-.1844518-02	.0000000	-.2029885+04	.2737449+04	.0000000	.0000000
-.8678958-04	.0000000	-.6346611+04	-.6627482+04	-.1004235+04	.0000000

THETA ANGLE= 3.14160 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.1167994-03	-.2217632-03	.9277245-09	-.3234696-03	-.2099575-03	.0000000
.1044225-08	-.1397626+04	.4605100-10	-.1397499+04	.1493722-01	.0000000
.1387835-02	-.1397499+04	-.4781917+04	-.5044295+04	.1493739-01	.0000000
.1452407-01	-.1822009-01	.8180305+04	.8180486+04	.9960029-05	.0000000
-.1669278-02	.0000000	.2922978+04	.2922954+04	.0000000	.0000000

.4431787-08	.0000000	-.5894287+04	-.8802162+04	.1171168-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.1572602-03	-.1551189-03	.8748291-04	-.2348467-03	-.1011132-03	.0000000
-.1033210-03	-.1339580+04	-.3571642-04	-.9551042+03	.1507404+04	.0000000
.1479794-02	-.9551042+03	-.4770157+04	-.4764773+04	.1528749+04	.0000000
.1339088-01	-.8678233+03	.5003282+04	.5003527+04	.1202794+04	.0000000
-.1844525-02	.0000000	.2737442+04	-.2030016+04	.0000000	.0000000
.8677883-04	.0000000	-.6346632+04	-.6627434+04	.1004245+04	.0000000

THETA ANGLE= 4.71240 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.2238972-03	-.1866438-03	.1180571-03	-.2926580-03	-.6944653-04	.0000000
-.8414249-03	-.1757402+04	-.1875576-03	-.1213812+04	.2378102+04	.0000000
.1827741-02	-.1213812+04	-.6431323+04	-.6338148+04	.2481105+04	.0000000
.1689952-01	.1786949+04	.5281775+04	.5282204+04	.5804216+04	.0000000
-.2422220-02	.0000000	.6671024+04	-.8124119+04	.0000000	.0000000
-.1034847-02	.0000000	-.8563244+04	-.8189938+04	.1006820+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.1905900+00	.1092000+02	.1000000-01	.1701700-02	.1067484+02	.1000000+00
-.2466339-03	-.4902807-03	.7947486-04	-.7347918-03	-.3646023-03	.0000000
-.1086616-02	-.2964270+04	-.2295266-03	-.3348758+04	.1855729+04	.0000000
.2353793-02	-.3348758+04	-.1048182+05	-.1109087+05	.1980050+04	.0000000
.2923883-01	.3394880+04	.1680077+05	.1680143+05	.7005502+04	.0000000
-.3218565-02	.0000000	.1351511+05	-.2640722+04	.0000000	.0000000
-.1550246-02	.0000000	-.1237019+05	-.1938683+05	.4196193+03	.0000000

THETA ANGLE= .00000 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.2202388-03	-.6966239-03	.0000000	-.9208631-03	-.5815648-03	.0000000
.0000000	-.4624847+04	.0000000	-.5707550+04	.0000000	.0000000
.2589163-02	-.5707550+04	-.1262298+05	-.1381385+05	.0000000	.0000000
.3466623-01	.0000000	.2309536+05	.2309591+05	.0000000	.0000000
-.4175078-02	.0000000	.8783485+04	.8783470+04	.0000000	.0000000
.0000000	.0000000	-.1362929+05	-.2638716+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.2244476-03	-.4958564-03	-.8374822-04	-.6238372-03	-.3730409-03	.0000000

.1126832-02	-.3498340+04	.2383224-03	-.3860271+04	-.1946761+04	.0000000
.2358728-02	-.3860271+04	-.1032059+05	-.1099904+05	-.2075879+04	.0000000
.2724705-01	-.3195166+04	.1515607+05	.1515649+05	-.7275806+04	.0000000
-.3610020-02	.0000000	-.4257283+04	.1255451+05	.0000000	.0000000
.1414474-02	.0000000	-.1166874+05	-.1908095+05	-.4510466+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.2036573-03	-.2000537-03	-.1166259-03	-.1914551-03	-.8819298-04	.0000000
.8493410-03	-.1757889+04	.1859145-03	-.1187035+04	-.2350828+04	.0000000
.1881735-02	-.1187035+04	-.6397686+04	-.6388635+04	-.2452918+04	.0000000
.1544401-01	-.1585404+04	.3949128+04	.3949317+04	-.5752771+04	.0000000
-.2561221-02	.0000000	-.9187772+04	.5465885+04	.0000000	.0000000
.9265938-03	.0000000	-.8009888+04	-.8177953+04	-.9930376+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.1390955-03	-.1713850-03	-.8118542-04	-.1617002-03	-.1124529-03	.0000000
.7432084-04	-.1402196+04	.2460094-04	-.1040268+04	-.1377809+04	.0000000
.1516927-02	-.1040268+04	-.4787787+04	-.4868480+04	-.1393068+04	.0000000
.1227956-01	.9530485+03	.3999536+04	.3999611+04	-.8598590+03	.0000000
-.1958423-02	.0000000	-.2500719+04	.1410901+04	.0000000	.0000000
-.1040673-03	.0000000	-.5870367+04	-.6800724+04	-.9533154+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.9953327-04	-.2377502-03	.8394165-09	-.2672997-03	-.2130352-03	.0000000
.1495106-08	-.1660443+04	.2046245-09	-.1719448+04	.1311327-01	.0000000
-.1398678-02	-.1719444+04	-.4798401+04	-.5143912+04	.1302667-01	.0000000
.1349894-01	-.1886003-01	.7317543+04	.7317607+04	-.4880044-02	.0000000
-.1839367-02	.0000000	.2145783+04	.2145761+04	.0000000	.0000000
.4356179-08	.0000000	-.5429151+04	-.9020234+04	.1100427-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.1390967-03	-.1713835-03	-.8118663-04	-.1616977-03	-.1124503-03	.0000000
-.7432966-04	-.1402192+04	-.2460287-04	-.1040251+04	.1377833+04	.0000000
.1516932-02	-.1040251+04	-.4787794+04	-.4868479+04	.1393094+04	.0000000
.1227954-01	-.9530320+03	.3999452+04	.3999528+04	.8599188+03	.0000000
-.1958429-02	.0000000	.1410902+04	-.2500866+04	.0000000	.0000000
.1040577-03	.0000000	-.5870387+04	-.6800674+04	.9533257+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.2036582-03	-.2000570-03	.1166259-03	-.1914599-03	-.8819568-04	.0000000
-.8493565-03	-.1757910+04	-.1859176-03	-.1187065+04	.2350837+04	.0000000
.1881744-02	-.1187065+04	-.6397743+04	-.6388699+04	.2452928+04	.0000000
.1544417-01	.1585465+04	.3949244+04	.3949433+04	.5752865+04	.0000000
-.2561238-02	.0000000	.5466017+04	-.9187806+04	.0000000	.0000000
-.9266161-03	.0000000	-.8009948+04	-.8178080+04	.9930302+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.2008001+00	.1150500+02	.1000000-01	.1701700-02	.1123920+02	.1000000+00
-.2244476-03	-.4958627-03	.8374701-04	-.6238465-03	-.3730474-03	.0000000
-.1126823-02	-.3498376+04	-.2383205-03	-.3860328+04	.1946737+04	.0000000
.2358736-02	-.3860328+04	-.1032066+05	-.1099913+05	.2075854+04	.0000000
.2724729-01	.3195149+04	.1515632+05	.1515674+05	.7275746+04	.0000000
-.3610038-02	.0000000	-.1255458+05	-.4257067+04	.0000000	.0000000
-.1414465-02	.0000000	-.1166881+05	-.1908118+05	.4510363+03	.0000000

THETA ANGLE= .00000 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1936994-03	-.6982721-03	.0000000	-.7845302-03	-.5738176-03	.0000000
.0000000	-.5559330+04	.0000000	-.6629508+04	.0000000	.0000000
.2528966-02	-.6629508+04	-.1238382+05	-.1364517+05	.0000000	.0000000
.3209271-01	.0000000	.2078611+05	.2078641+05	.0000000	.0000000
-.4666962-02	.0000000	.6995660+04	.6995627+04	.0000000	.0000000
.0000000	.0000000	-.1270082+05	-.2584192+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1996467-03	-.5025579-03	-.8702318-04	-.4996320-03	-.3750288-03	.0000000
.1158126-02	-.4028137+04	.2452380-03	-.4367422+04	-.2016957+04	.0000000
.2338686-02	-.4367422+04	-.1015911+05	-.1091632+05	-.2149844+04	.0000000
.2504946-01	-.2903491+04	.1319273+05	.1319290+05	-.7488201+04	.0000000
-.3933852-02	.0000000	-.6875636+04	-.1124932+05	.0000000	.0000000
.1274261-02	.0000000	-.1086418+05	-.1874847+05	-.4746946+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1826565-03	-.2143332-03	-.1152581-03	-.9531202-04	-.1013024-03	.0000000
.8533909-03	-.1742929+04	.1829930-03	-.1152575+04	-.2321429+04	.0000000
.1912523-02	-.1152575+04	-.6364693+04	-.6443846+04	-.2421927+04	.0000000
.1392472-01	-.1355682+04	.2606908+04	.2606878+04	-.5663068+04	.0000000
-.2643477-02	.0000000	-.1022427+05	.4213044+04	.0000000	.0000000

.8197362-03	.0000000	-.7423706+04	-.8200673+04	-.9832437+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1213301-03	-.1867058-03	-.7597613-04	-.9189868-04	-.1191742-03	.0000000
.4875462-04	-.1453761+04	.1355382-04	-.1114478+04	-.1266037+04	.0000000
.1533330-02	-.1114478+04	-.4799796+04	-.4963209+04	-.1275276+04	.0000000
.1111433-01	.9862496+03	.2975856+04	.2975779+04	-.5206081+03	.0000000
-.2031226-02	.0000000	-.3000697+04	.9180563+02	.0000000	.0000000
-.1149738-03	.0000000	-.5388333+04	-.6954536+04	-.9158170+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.8294374-04	-.2515878-03	.7669134-09	-.2079051-03	-.2119821-03	.0000000
.1883745-08	-.1918599+04	.3583149-09	-.2029125+04	.1155778+01	.0000000
.1390023-02	-.2029125+04	-.4804599+04	-.5226177+04	.1138742-01	.0000000
.1238541-01	-.1864846-01	.6337183+04	.6337132+04	-.9599840-02	.0000000
-.1976290-02	.0000000	.1280345+04	.1280329+04	.0000000	.0000000
.4190978-08	.0000000	-.4956800+04	-.9162708+04	.1048221-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1213314-03	-.1867043-03	.7597732-04	-.9189578-04	-.1191718-03	.0000000
-.4876349-04	-.1453751+04	-.1355572-04	-.1114455+04	.1266061+04	.0000000
.1533336-02	-.1114455+04	-.4799803+04	-.4963204+04	.1275301+04	.0000000
.1111431-01	-.9862356+03	.2975770+04	.2975693+04	.5206669+03	.0000000
-.2031230-02	.0000000	.9181562+02	-.3000858+04	.0000000	.0000000
.1149652-03	.0000000	-.5388353+04	-.6954486+04	.9158272+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1826563-03	-.2143365-03	.1152582-03	-.9531626-04	-.1013050-03	.0000000
-.8534072-03	-.1742955+04	-.1829964-03	-.1152609+04	.2321440+04	.0000000
.1912532-02	-.1152609+04	-.6364749+04	-.6443908+04	.2421940+04	.0000000
.1392487-01	.1355740+04	.2607014+04	.2606985+04	.5663170+04	.0000000
-.2643496-02	.0000000	.4213195+04	-.1022434+05	.0000000	.0000000
-.8197567-03	.0000000	-.7423763+04	-.8200795+04	.9832372+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.2110103+00	.1209000+02	.1000000-01	.1701700-02	.1180239+02	.1000000+00
-.1996466-03	-.5025641-03	.8702198-04	-.4996409-03	-.3750350-03	.0000000

-.1158117-02	-.4028185+04	-.2452361-03	-.4367493+04	.2016933+04	.0000000
-.2338693-02	-.4367493+04	-.1015918+05	-.1091641+05	.2149819+04	.0000000
.2504969-01	.2903477+04	.1319296+05	.1319313+05	.7488142+04	.0000000
-.3933876-02	.0000000	.1129940+05	-.6075446+04	.0000000	.0000000
-.1274252-02	.0000000	-.1086424+05	-.1874869+05	.4746844+03	.0000000

THETA ANGLE= .00000 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1642801-03	-.7001212-03	.0000000	-.6209356-03	-.5592481-03	.0000000
.0000000	-.6506080+04	.0000000	-.7552637+04	.0000000	.0000000
.2440095-02	-.7552637+04	-.1214673+05	-.1348625+05	.0000000	.0000000
.2926100-01	.0000000	.1792575+05	.1792576+05	.0000000	.0000000
-.5072602-02	.0000000	.4736762+04	.4736709+04	.0000000	.0000000
.0000000	.0000000	-.1164525+05	-.2519549+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1729969-03	-.5096939-03	-.8964727-04	-.3619303-03	-.3709103-03	.0000000
.1181092-02	-.4555318+04	.2493157-03	-.4871343+04	-.2069591+04	.0000000
.2291315-02	-.4871343+04	-.1000031+05	-.1084198+05	-.2204719+04	.0000000
.2268720-01	-.2528857+04	.1091223+05	.1091213+05	-.7614475+04	.0000000
-.4182353-02	.0000000	-.8071912+04	.9576409+04	.0000000	.0000000
.1130976-02	.0000000	-.9977040+04	-.1837201+05	-.4973016+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1615552-03	-.2288481-03	-.1140252-03	-.4269496-05	-.1096770-03	.0000000
.8535757-03	-.1708202+04	.1784854-03	-.1108575+04	-.2290304+04	.0000000
.1919300-02	-.1108575+04	-.6333046+04	-.6501236+04	-.2388370+04	.0000000
.1237355-01	-.1101466+04	.1270429+04	.1270201+04	-.5525981+04	.0000000
-.2671871-02	.0000000	-.1121178+05	.2918077+04	.0000000	.0000000
.7150782-03	.0000000	-.6829309+04	-.8243114+04	-.9791016+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1041719-03	-.2009851-03	-.7160852-04	-.2509759-04	-.1220281-03	.0000000
.2605013-04	-.1494962+04	.3101563-05	-.1178939+04	-.1169388+04	.0000000
-.1529142-02	-.1178939+04	-.4807837+04	-.5049838+04	-.1172945+04	.0000000
.9918541-02	.9711340+03	.1938702+04	.1938487+04	-.2004665+03	.0000000
-.2064745-02	.0000000	-.3537633+04	-.1203305+04	.0000000	.0000000
-.1196986-03	.0000000	-.4908552+04	-.7086556+04	-.8873525+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.6694756-04	-.2635393-03	.7063873-09	-.1445791-03	-.2072734-03	.0000000
.2218483-08	-.2178063+04	.4984152-09	-.2330758+04	.1023013-01	.0000000
.1362221-02	-.2330758+04	-.4803480+04	-.5294907+04	.9983565-02	.0000000
.1120334-01	-.1765107-01	.5235189+04	.5235023+04	-.1389394-01	.0000000
-.2077848-02	.0000000	.3204951+03	.3204752+03	.0000000	.0000000
.3941497-08	.0000000	-.4477323+04	-.9235380+04	.1007588-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1041731-03	-.2009837-03	.7160970-04	-.2509450-04	-.1220260-03	.0000000
-.2605899-04	-.1494945+04	-.3103418-05	-.1178910+04	.1169411+04	.0000000
.1929147-02	-.1178910+04	-.4807844+04	-.5049838+04	.1172970+04	.0000000
.9918520-02	-.9711225+03	.1938617+04	.1938402+04	.2005239+03	.0000000
-.2064747-02	.0000000	-.1203286+04	-.3537803+04	.0000000	.0000000
.1196911-03	.0000000	-.4908572+04	-.7086508+04	.8873627+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1615559-03	-.2288513-03	.1140255-03	-.4273000-05	-.1096796-03	.0000000
-.8535927-03	-.1708234+04	-.1784890-03	-.1108613+04	.2290318+04	.0000000
.1919308-02	-.1108613+04	-.6333100+04	-.6501296+04	.2388385+04	.0000000
.1237368-01	.1101517+04	.1270522+04	.1270294+04	.5526090+04	.0000000
-.2671893-02	.0000000	.2918241+04	-.1121188+05	.0000000	.0000000
-.7150966-03	.0000000	-.6824361+04	-.8243231+04	.9790958+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.2212205+00	.1267500+02	.1000000-01	.1701700-02	.1236435+02	.1000000+00
-.1729967-03	-.5096998-03	.8964608-04	-.3619383-03	-.3709162-03	.0000000
-.1181083-02	-.4555379+04	-.2493138-03	-.4871427+04	.2069567+04	.0000000
.2291321-02	-.4871427+04	-.1000038+05	-.1084207+05	.2204694+04	.0000000
.2268740-01	.2528846+04	.1091294+05	.1091235+05	.7614417+04	.0000000
-.4182381-02	.0000000	.9576494+04	-.8071756+04	.0000000	.0000000
-.1130969-02	.0000000	-.9977095+04	-.1837223+05	.4972915+03	.0000000

THETA ANGLE= .00000 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.1328312-03	-.7014404-03	.0000000	-.4291468-03	-.5378358-03	.0000000
.0000000	-.7470579+04	.0000000	-.8480432+04	.0000000	.0000000
.2320271-02	-.8480432+04	-.1191713+05	-.1333857+05	.0000000	.0000000
.2622559-01	.0000000	.1449859+05	.1449826+05	.0000000	.0000000
-.5376060-02	.0000000	.1990703+04	.1990629+04	.0000000	.0000000

.0000000	.0000000	-.1048393+05	-.2442744+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.1452796-03	-.5165741-03	-.9190908-04	-.2104887-03	-.3609787-03	.0000000
.1196057-02	-.5081137+04	.2497528-03	-.5372971+04	-.2107363+04	.0000000
.2215112-02	-.5372971+04	-.9847491+04	-.1077566+05	-.2242785+04	.0000000
.2020613-01	-.2076258+04	.8315245+04	.8314875+04	-.7630981+04	.0000000
-.4347686-02	.0000000	-.1022698+05	.7515395+04	.0000000	.0000000
.9864870-03	.0000000	-.9028188+04	-.1793433+05	-.5244815+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.1408981-03	-.2431239-03	-.1129861+03	.8121543-04	-.1140127-03	.0000000
.8497903-03	-.1650557+04	.1721514-03	-.1053423+04	-.2257818+04	.0000000
.1901905-02	-.1053423+04	-.6303418+04	-.6558940+04	-.2352483+04	.0000000
.1082087-01	-.8255375+03	-.4163062+02	-.4203674+02	-.5334390+04	.0000000
-.2649453-02	.0000000	-.1212769+05	.1590946+04	.0000000	.0000000
.6136050-03	.0000000	-.6228121+04	-.8295696+04	-.9819483+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.8781924-04	-.2141286-03	-.6787730-04	.3890763-04	-.1216111-03	.0000000
.5732058-05	-.1526456+04	-.6293038-05	-.1234624+04	-.1085673+04	.0000000
-.1504790-02	-.1234624+04	-.4813444+04	-.5129185+04	-.1084129+04	.0000000
.8714511-02	.9087579+03	.8942978+03	.8939576+03	.8698849+02	.0000000
-.2060641-02	.0000000	-.4118018+04	-.2459313+04	.0000000	.0000000
-.1187144+03	.0000000	-.4438372+04	-.7194809+04	-.8641988+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.5157066-04	-.2737160-03	-.6546370-09	-.7644428-04	-.1993169-03	.0000000
.2505993-08	-.2443477+04	.6173813-09	-.2627888+04	.9097005-02	.0000000
-.1315726-02	-.2627888+04	-.4797981+04	-.5353232+04	.8785722-02	.0000000
.9973936-02	-.1589189-01	.4003706+04	.4003424+04	-.1754080-01	.0000000
-.2141684-02	.0000000	-.7428725+03	-.7428932+03	.0000000	.0000000
.3617699-08	.0000000	-.3992951+04	-.9239404+04	.9726416-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.8782038-04	-.2141272-03	.6787847-04	.3891070-04	-.1216091-03	.0000000

-.5740883-05	-.1526434+04	.6291250-05	-.1234588+04	.1085696+04	.0000000
.1504796-02	-.1234588+04	-.4813451+04	-.5129185+04	.1084153+04	.0000000
.8714488-02	-.9087493+03	.8942158+03	.8938756+03	-.8693311+02	.0000000
-.2060641-02	.0000000	-.2459283+04	-.4118193+04	.0000000	.0000000
.1187081-03	.0000000	-.4438391+04	-.7194763+04	.8642090+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2314307+00	.1326000+02	.1000000+01	.1701700-02	.1292502+02	.1000000+00
-.1408987-03	-.2431271-03	-.1129865-03	.8121284-04	-.1140152-03	.0000000
-.8498078-03	-.1650594+04	-.1721552-03	-.1053466+04	.2257833+04	.0000000
.1901912-02	-.1053466+04	-.6303470+04	-.6558999+04	.2352500+04	.0000000
.1082098-01	.8255815+03	-.4155341+02	-.4195953+02	.5334503+04	.0000000
-.2649477-02	.0000000	.1591117+04	-.1212782+05	.0000000	.0000000
-.6136212-03	.0000000	-.6228168+04	-.8295808+04	.9819433+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.2314307+00	.1326000+02	.1000000-01	.1701700-02	.1292502+02	.1000000+00
-.1452793-03	-.5165799-03	.9190790-04	-.2104954-03	-.3609842-03	.0000000
-.1196048-02	-.5081211+04	-.2497510-03	-.5373068+04	.2107340+04	.0000000
.2215116-02	-.5373068+04	-.9847558+04	-.1077574+05	.2242760+04	.0000000
.2020632-01	.2076249+04	.8315436+04	.8315066+04	.7630926+04	.0000000
-.4347719-02	.0000000	.7515482+04	-.1022687+05	.0000000	.0000000
-.9864807-03	.0000000	-.9028236+04	-.1793453+05	.5244713+03	.0000000

THETA ANGLE= .00000 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.1003394-03	-.7013558-03	.0000000	-.2079726-03	-.5095910-03	.0000000
.0000000	-.8457057+04	.0000000	-.9415815+04	.0000000	.0000000
.2168283-02	-.9415815+04	-.1170102+05	-.1320348+05	.0000000	.0000000
.2305032-01	.0000000	.1048521+05	.1048451+05	.0000000	.0000000
-.5560783-02	.0000000	-.1261925+04	-.1262024+04	.0000000	.0000000
.0000000	.0000000	-.9241534+04	-.2351290+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.1173014-03	-.5224947-03	-.9405909-04	-.4506449-04	-.3454804-03	.0000000
.1203131-02	-.5606519+04	.2458378-03	-.5873040+04	-.2132584+04	.0000000
.2109467-02	-.5873040+04	-.9704276+04	-.1071719+05	-.2265978+04	.0000000
.1765670-01	-.1548211+04	.5401694+04	.5401032+04	-.7516748+04	.0000000
-.4421878-02	.0000000	-.1252475+05	.5047213+04	.0000000	.0000000
.8430943-03	.0000000	-.8039051+04	-.1741785+05	-.5611442+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.1211302-03	-.2568054-03	-.1121917-03	.1603968-03	-.1148616-03	.0000000
.8418430-03	-.1567525+04	.1637956-03	-.9856857+03	-.2224311+04	.0000000
.1860713-02	-.9856857+03	-.6276395+04	-.6615540+04	-.2314506+04	.0000000
.9295191-02	-.5300204+03	-.1308266+04	-.1308830+04	-.5082506+04	.0000000
-.2579625-02	.0000000	-.1294878+05	.2446586+03	.0000000	.0000000
.5164276-03	.0000000	-.5649048+04	-.8352782+04	-.9929076+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.7246249-04	-.2260437-03	-.6460383-04	.1002223-03	-.1184058-03	.0000000
-.1258099-04	-.1548853+04	-.1419489-04	-.1282335+04	-.1013067+04	.0000000
.1460980-02	-.1282335+04	-.4818055+04	-.5201975+04	-.1007229+04	.0000000
.7523634-02	.7986389+03	-.1513548+03	-.1518096+03	.3289713+03	.0000000
-.2020489-02	.0000000	-.4748031+04	-.3661650+04	.0000000	.0000000
-.1127518-03	.0000000	-.3984605+04	-.7277565+04	-.8430351+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.3692832-04	-.2021091-03	.6088784-09	-.2503651-05	-.1884571-03	.0000000
.2751307-08	-.2718619+04	.7082135-09	-.2923535+04	.8130509-02	.0000000
.1251188-02	-.2923535+04	-.4790860+04	-.5403769+04	.7769646-02	.0000000
.8719950-02	-.1337031-01	.2631950+04	.2631545+04	-.2033460-01	.0000000
-.2164699-02	.0000000	-.1921138+04	-.1921161+04	.0000000	.0000000
.3233719-08	.0000000	-.3507685+04	-.9172320+04	.9381514-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.7246359-04	-.2260424-03	.6460500-04	.1002252-03	-.1184040-03	.0000000
.1257225-04	-.1548824+04	.1419319-04	-.1282292+04	.1013090+04	.0000000
.1460987-02	-.1282292+04	-.4818062+04	-.5201976+04	.1007253+04	.0000000
.7523612-02	-.7986328+03	-.1514296+03	-.1518838+03	-.3289185+03	.0000000
-.2020488-02	.0000000	-.3661607+04	-.4748207+04	.0000000	.0000000
.1127464-03	.0000000	-.3984624+04	-.7277522+04	.8430454+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.1211307-03	-.2568085-03	.1121922-03	.1603953-03	-.1148639-03	.0000000
-.8418609-03	-.1567567+04	-.1637994-03	-.9857335+03	.2224327+04	.0000000
.1860720-02	-.9857335+03	-.6276445+04	-.6615598+04	.2314525+04	.0000000
.9295296-02	.5300550+03	-.1308208+04	-.1308772+04	.5082622+04	.0000000
-.2579650-02	.0000000	.2448301+03	-.1294895+05	.0000000	.0000000

-.5164417-03	.0000000	-.5649090+04	-.8352887+04	.9929035+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.2416409+00	.1384500+02	.1000000-01	.1701700-02	.1348434+02	.1000000+00
-.1173009-03	-.5225004-03	.9405793-04	-.4506946-04	-.3454855-03	.0000000
-.1203122-02	-.5606608+04	-.2458361-03	-.5873150+04	.2132560+04	.0000000
.2109469-02	-.9873150+04	-.9704341+04	-.1071727+05	.2265953+04	.0000000
.1765687-01	.1548206+04	.5401850+04	.5401188+04	.7516695+04	.0000000
-.4421915-02	.0000000	.5047296+04	-.1252469+05	.0000000	.0000000
-.8430890-03	.0000000	-.8039091+04	-.1741804+05	.5611339+03	.0000000

THETA ANGLE= .00000 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.6792428-04	-.6988628-03	.0000000	.4396215-04	-.4745361-03	.0000000
.0000000	-.9468878+04	.0000000	-.1036123+05	.0000000	.0000000
-.1984159-02	-.1036123+05	-.1150502+05	-.1308229+05	.0000000	.0000000
.1980877-01	.0000000	.5863426+04	.5862306+04	.0000000	.0000000
-.5609474-02	.0000000	-.5043133+04	-.5043260+04	.0000000	.0000000
.0000000	.0000000	-.7945975+04	-.2242319+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.8990174-04	-.5267304-03	-.9632298-04	.1345795-03	-.3246243-03	.0000000
.1202250-02	-.6132139+04	.2369098-03	-.6372107+04	-.2147281+04	.0000000
-.1974717-02	-.6372107+04	-.9574588+04	-.1066659+05	-.2275982+04	.0000000
.1509398-01	-.9456544+03	.2170936+04	.2169965+04	-.7252286+04	.0000000
-.4396815-02	.0000000	-.1495090+05	.2153279+04	.0000000	.0000000
.7034953-03	.0000000	-.7031833+04	-.1680459+05	-.6117626+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.1026188-03	-.2696325-03	-.1116877-03	.2323145-03	-.1126735-03	.0000000
.8294845-03	-.1457048+04	.1532541-03	-.9040656+03	-.2190122+04	.0000000
.1796559-02	-.9040656+03	-.6252455+04	-.6669947+04	-.2274691+04	.0000000
.7822950-02	-.2165716+03	-.2506672+04	-.2507374+04	-.4765484+04	.0000000
-.2466279-02	.0000000	-.1365130+05	-.1105474+04	.0000000	.0000000
.4247608-03	.0000000	-.5098948+04	-.8411822+04	-.1012961+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.5828506-04	-.2366391-03	-.6162713-04	.1588814-03	-.1128091-03	.0000000

-.2917733-04	-.1562703+04	-.2017480-04	-.1322737+04	-.9500191+03	.0000000
-.1398687-02	-.1322737+04	-.4823024+04	-.5268676+04	-.9409180+03	.0000000
.6366403-02	.6393682+03	-.1192500+04	-.1193058+04	.5128463+03	.0000000
-.1945825-02	.0000000	-.5434085+04	-.4795809+04	.0000000	.0000000
-.1027897-03	.0000000	-.3553630+04	-.7333254+04	-.8207761+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.2321223-04	-.2886101-03	.5666026-09	.7833190-04	-.1749825-03	.0000000
.2957907-08	-.3006683+04	.7640953-09	-.3220295+04	.7306758-02	.0000000
-.1169533-02	-.3220295+04	-.4785288+04	-.5448750+04	.6915018-02	.0000000
.7466073-02	-.1007064-01	.1106755+04	.1106220+04	-.2207459-01	.0000000
-.2143243-02	.0000000	-.3227562+04	-.3227590+04	.0000000	.0000000
.2807670-08	.0000000	-.3027058+04	-.9028719+04	.8992771-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.5828613-04	-.2366379-03	.6162829-04	-.1588837-03	-.1128075-03	.0000000
.2916872-04	-.1562666+04	.2017321+04	-.1322688+04	.9500419+03	.0000000
-.1398694-02	-.1322688+04	-.4823031+04	-.5268878+04	.9409417+03	.0000000
.6366381-02	-.6393659+03	-.1192563+04	-.1193121+04	-.5127968+03	.0000000
-.1945822-02	.0000000	-.4795751+04	-.5434257+04	.0000000	.0000000
.1027853-03	.0000000	-.3553650+04	-.7333216+04	.8207866+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.1026191-03	-.2696356-03	.1116882-03	.2323143-03	-.1126757-03	.0000000
-.8295026-03	-.1457096+04	-.1532579-03	-.9041182+03	.2190139+04	.0000000
-.1796565-02	-.9041182+03	-.6252505+04	-.6670003+04	.2274711+04	.0000000
.7823040-02	.2165950+03	-.2506637+04	-.2507339+04	.4765598+04	.0000000
-.2466304-02	.0000000	-.1105318+04	-.1365149+05	.0000000	.0000000
-.4247727-03	.0000000	-.5098985+04	-.8411921+04	.1012957+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.2518511+00	.1443000+02	.1000000-01	.1701700-02	.1404225+02	.1000000+00
-.8990113-04	-.6267358-03	.9632182-04	-.1345748-03	-.3246290-03	.0000000
-.1202241-02	-.6132242+04	-.2369082-03	-.6372230+04	.2147258+04	.0000000
-.1974718-02	-.6372230+04	-.9574650+04	-.1066667+05	.2275958+04	.0000000
.1509413-01	.9456521+03	.2171049+04	.2170078+04	.7252237+04	.0000000
-.4396853-02	.0000000	-.2153351+04	-.1495098+05	.0000000	.0000000
-.7034908-03	.0000000	-.7031864+04	-.1680472+05	.6117521+03	.0000000

THETA ANGLE= .00000 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.3683779-04	-.6928311-03	.0000000	.3281711-03	-.4326968-03	.0000000
.0000000	-.1050880+05	.0000000	-.1131871+05	.0000000	.0000000
.1769348-02	-.1131871+05	-.1133640+05	-.1297631+05	.0000000	.0000000
.1658470-01	.0000000	.6088069+03	.6072182+03	.0000000	.0000000
-.5504007-02	.0000000	-.9377070+04	-.9377228+04	.0000000	.0000000
.0000000	.0000000	-.6628446+04	-.2112611+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.6395906-04	-.5285289-03	-.9891082-04	.3286724-03	-.2985886-03	.0000000
.1193217-02	-.6658463+04	.2223332-03	-.6870572+04	-.2153296+04	.0000000
.1812213-02	-.6870572+04	.9462669+04	-.1062403+05	-.2274304+04	.0000000
.1257772-01	-.2684802+03	-.1378040+04	-.1379337+04	-.6818837+04	.0000000
-.4264248-02	.0000000	-.1749217+05	-.1184979+04	.0000000	.0000000
.5707600-03	.0000000	-.6029695+04	-.1607579+05	-.6805523+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.8566312-04	-.2814249-03	-.1115167-03	.2958413-03	-.1078242-03	.0000000
.8124334-03	-.1317321+04	.1403859-03	-.8073728+03	-.2155595+04	.0000000
.1710660-02	-.8073728+03	-.6231952+04	-.6721314+04	-.2233308+04	.0000000
.6428146-02	.1134857+03	-.3612550+04	-.3613366+04	-.4379154+04	.0000000
-.2313911-02	.0000000	-.1421087+05	-.2442282+04	.0000000	.0000000
.3399070-03	.0000000	-.4587928+04	-.8472809+04	-.1042994+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.4546390-04	-.2458249-03	-.5879754-04	.2148692-03	-.1051513-03	.0000000
-.4425788-04	-.1568496+04	-.2379658-04	-.1356389+04	-.8951766+03	.0000000
.1319138-02	-.1356389+04	-.4829635+04	-.5330504+04	-.8840718+03	.0000000
.5262416-02	.4289694+03	-.2223630+04	-.2224282+04	.6257518+03	.0000000
-.1838178-02	.0000000	-.6183136+04	-.5847062+04	.0000000	.0000000
-.9005637-04	.0000000	-.3151457+04	-.7360430+04	-.7944608+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.1068238-04	-.2930257-03	.5254768-09	.1672299-03	-.1591337-03	.0000000
.3127893-08	-.3310451+04	.7781768-09	-.3520427+04	.6604810-02	.0000000
.1072039-02	-.3520427+04	-.4784297+04	-.5490122+04	.6204477-02	.0000000
.6239263-02	-.5967812-02	-.5870730+03	-.5877487+03	-.2255875-01	.0000000
-.2073018-02	.0000000	-.4677046+04	-.4677082+04	.0000000	.0000000

.2361602-08	.0000000	-.2558009+04	-.8800683+04	.8513902-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.4546494-04	-.2458238-03	.5879870-04	.2148707-03	-.1051500-03	.0000000
.4424944-04	-.1568451+04	.2379512-04	-.1356333+04	.8951990+03	.0000000
.1319146-02	-.1356333+04	-.4829643+04	-.5330506+04	.8840950+03	.0000000
.5262396-02	-.4289705+03	-.2223677+04	-.2224329+04	-.6257063+03	.0000000
-.1838175-02	.0000000	-.5846987+04	-.6183298+04	.0000000	.0000000
.9005284-04	.0000000	-.3151478+04	-.7360398+04	.7944716+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.8566331-04	-.2814279-03	.1115173-03	.2958425-03	-.1078262-03	.0000000
-.8124516-03	-.1317374+04	-.1403896-03	-.8074302+03	.2155613+04	.0000000
.1710665-02	-.8074302+03	-.6232001+04	-.6721369+04	.2233329+04	.0000000
.6428222-02	-.1134755+03	-.3612541+04	-.3613357+04	.4379263+04	.0000000
-.2313936-02	.0000000	-.2942133+04	-.1421109+05	.0000000	.0000000
-.3399167-03	.0000000	-.4587958+04	-.8472900+04	.1042992+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.2620613+00	.1501500+02	.1000000-01	.1701700-02	.1459871+02	.1000000+00
-.6395828-04	-.5285341-03	.9890966-04	.3286725-03	-.2985928-03	.0000000
-.1193208-02	-.6658583+04	-.2223317-03	-.6870710+04	.2153273+04	.0000000
.1812213-02	-.6870710+04	-.9462729+04	-.1062410+05	.2274281+04	.0000000
.1257785-01	.2684814+03	-.1377981+04	-.1379278+04	.6818792+04	.0000000
-.4264287-02	.0000000	-.1184925+04	-.1749224+05	.0000000	.0000000
-.5707565-03	.0000000	-.6029716+04	-.1607595+05	.6805414+03	.0000000

THETA ANGLE= .00000 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.8466594-05	-.6820073-03	.0000000	.6462769-03	-.3840969-03	.0000000
.0000000	-.1157911+05	.0000000	-.1228997+05	.0000000	.0000000
.1526890-02	-.1228997+05	-.1120311+05	-.1288688+05	.0000000	.0000000
.1347254-01	.0000000	-.5304880+04	-.5306990+04	.0000000	.0000000
-.5225351-02	.0000000	-.1428971+05	-.1428990+05	.0000000	.0000000
.0000000	.0000000	-.5323506+04	-.1958609+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.4039546-04	-.5271065-03	-.1020238-03	.5374327-03	-.2675273-03	.0000000

.1175744+02	-.7185794+04	.2014808-03	-.7368703+04	-.2152344+04	.0000000
.1624381-02	-.7368703+04	-.9373082+04	-.1058979+05	-.2262333+04	.0000000
.1017246-01	.4841271+03	-.5246498+04	-.5248139+04	-.6197892+04	.0000000
-.4015802-02	.0000000	-.2013582+05	-.4986399+04	.0000000	.0000000
.4483220-03	.0000000	-.5056900+04	-.1521228+05	-.7715953+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.7050068-04	-.2920722-03	-.1117201-03	.3497125-03	-.1006340-03	.0000000
.7903998-03	-.1196685+04	.1250665-03	-.6944994+03	-.2121092+04	.0000000
.1604548-02	-.6944994+03	-.6215088+04	-.6768974+04	-.2190654+04	.0000000
.5131987-02	.4590730+03	-.4600272+04	-.4601179+04	-.3919841+04	.0000000
-.2127708-02	.0000000	-.1460253+05	-.3747013+04	.0000000	.0000000
.2632498-03	.0000000	-.4124509+04	-.8537931+04	-.1083835+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.3416951-04	-.2538130-03	-.5597221-04	.2681330-03	-.9571105-04	.0000000
-.5794576-04	-.1566666+04	-.2460933-04	-.1383759+04	-.8473344+03	.0000000
-.1223811-02	-.1383759+04	-.4839106+04	-.5387431+04	-.8357218+03	.0000000
.4230375-02	.1651006+03	-.3239475+04	-.3240210+04	.6543740+03	.0000000
-.1699100-02	.0000000	-.7002837+04	-.6800295+04	.0000000	.0000000
-.7603564-04	.0000000	-.2783767+04	-.7357744+04	-.7611759+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
.3375196-06	-.2950863-03	.4832724-09	.2654292-03	-.1411108-03	.0000000
.3262193-08	-.3632406+04	.7434418-09	-.3825916+04	.6005822-02	.0000000
.9604034-03	-.3825916+04	-.4791091+04	-.5529616+04	.5622860-02	.0000000
.5069136-02	-.1030655-02	-.2466532+04	-.2467362+04	-.2157993-01	.0000000
-.1949030-02	.0000000	-.6285983+04	-.6286030+04	.0000000	.0000000
.1921555-08	.0000000	-.2108820+04	-.8478066+04	.7899509-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.3417053-04	-.2535121-03	-.5597337-04	-.2681334-03	-.9570993-04	.0000000
.5793756-04	-.1566612+04	.2460803-04	-.1383695+04	.8473565+03	.0000000
-.1223820-02	-.1383695+04	-.4839113+04	-.5387438+04	.8357445+03	.0000000
.4230358-02	-.1651054+03	-.3239500+04	-.3240236+04	-.6543333+03	.0000000
-.1699095-02	.0000000	-.6800199+04	-.7002983+04	.0000000	.0000000
.7603290-04	.0000000	-.2783790+04	-.7357721+04	.7611872+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.7050074-04	-.2920751-03	.1117208-03	.3497153-03	-.1006358-03	.0000000
-.7904179-03	-.1146744+04	-.1250698-03	-.6945616+03	.2121111+04	.0000000
.1604552-02	-.6945616+03	-.6215135+04	-.6769028+04	.2190675+04	.0000000
.5132049-02	-.4590777+03	-.4600293+04	-.4601199+04	.3919942+04	.0000000
-.2127732-02	.0000000	-.3746888+04	-.1460277+05	.0000000	.0000000
-.2632525-03	.0000000	-.4124532+04	-.8538012+04	.1083835+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.2722715+00	.1560001+02	.1000000-01	.1701700-02	.1515364+02	.1000000+00
-.4039453-04	-.5271113-03	.1020226-03	.5374362-03	-.2675309-03	.0000000
-.1175736-02	-.7185930+04	-.2014796-03	-.7368855+04	.2152322+04	.0000000
.1624379-02	-.7368855+04	-.9373142+04	-.1058987+05	.2262310+04	.0000000
.1017256-01	-.4841224+03	-.5246503+04	-.5248144+04	.6197852+04	.0000000
-.4015840-02	.0000000	-.4986370+04	-.2013596+05	.0000000	.0000000
-.4483192-03	.0000000	-.5056911+04	-.1521241+05	.7715841+03	.0000000

THETA ANGLE= .00000 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.1566379-04	-.6650135-03	.0000000	.9999924-03	-.3287574-03	.0000000
.0000000	-.1268175+05	.0000000	-.1327639+05	.0000000	.0000000
.1261605-02	-.1327639+05	-.1111380+05	-.1281541+05	.0000000	.0000000
.1057788-01	.0000000	-.1190541+05	-.1190810+05	.0000000	.0000000
-.4753514-02	.0000000	-.1980866+05	-.1980888+05	.0000000	.0000000
.0000000	.0000000	-.4069213+04	-.1776427+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.2018090-04	-.5216437-03	-.1058592-03	.7610674-03	-.2315747-03	.0000000
.1149498-02	-.7714285+04	.1737237-03	-.7866638+04	-.2146074+04	.0000000
.1414791-02	-.7866638+04	-.9310717+04	-.1056431+05	-.2241386+04	.0000000
.7947537-02	.1313480+04	-.9435843+04	-.9437847+04	-.5370871+04	.0000000
-.3642977-02	.0000000	-.2286927+05	-.9270243+04	.0000000	.0000000
.3399752-03	.0000000	-.4138930+04	-.1419390+05	-.8889304+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.5730976-04	-.3015286-03	-.1123386-03	.3925449-03	-.9138114-04	.0000000
.7631062-03	-.9435742+03	.1071835-03	-.5644007+03	-.2086999+04	.0000000
.1479999-02	-.5644007+03	-.6201884+04	-.6812388+04	-.2147056+04	.0000000
.3952465-02	.8192934+03	-.5442980+04	-.5443951+04	-.3384243+04	.0000000
-.1913617-02	.0000000	-.1480058+05	-.4999487+04	.0000000	.0000000

.1962200-03	.0000000	-.3715709+04	-.8611364+04	-.1136274+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.2456569-04	-.2596179-03	-.5301156-04	.3185929-03	-.8472575-04	.0000000
-.7029902-04	-.1557589+04	-.2214258-04	-.1405238+04	-.8053896+03	.0000000
.1114419-02	-.1405238+04	-.4852593+04	-.5440190+04	-.7950115+03	.0000000
.3288061-02	-.1548187+03	-.4234982+04	-.4235793+04	.5848071+03	.0000000
-.1530178-02	.0000000	-.7901622+04	-.7639900+04	.0000000	.0000000
-.6247661-04	.0000000	-.2455937+04	-.7323945+04	-.7180010+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
.9462048-05	-.2944519-03	-.4378111-09	-.3742371-03	-.1210806-03	.0000000
.3360816-08	-.3974808+04	.6526238-09	-.4138518+04	.5492386-02	.0000000
.8368198-03	-.4138518+04	-.4809052+04	-.5568803+04	.5156567-02	.0000000
.3988366-02	.4776081-02	-.4550268+04	-.4551269+04	-.1892339-01	.0000000
-.1765557-02	.0000000	-.8072164+04	-.8072228+04	.0000000	.0000000
.1517681-08	.0000000	-.1689114+04	-.8048667+04	.7104198-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.2456668-04	-.2596172-03	-.5301273-04	.3185918-03	-.8472486-04	.0000000
.7029109-04	-.1557526+04	.2214146-04	-.1405166+04	.8054113+03	.0000000
-.1114427-02	-.1405166+04	-.4852600+04	-.5440193+04	.7950338+03	.0000000
.3288046-02	.1548101+03	-.4234979+04	-.4235791+04	-.5847720+03	.0000000
-.1530174-02	.0000000	-.7639781+04	-.7901745+04	.0000000	.0000000
.6247457-04	.0000000	-.2455962+04	-.7323933+04	.7180128+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.5730972-04	-.3015313-03	.1123394-03	.3925495-03	-.9138267-04	.0000000
-.7631241-03	-.9436382+03	-.1071864-03	-.5644679+03	.2087018+04	.0000000
.1480002-02	-.5644679+03	-.6201931+04	-.6812442+04	.2147077+04	.0000000
.3952514-02	-.8193150+03	-.5443034+04	-.5444005+04	.3384330+04	.0000000
-.1913639-02	.0000000	-.4999395+04	-.1480084+05	.0000000	.0000000
-.1962260-03	.0000000	-.3715727+04	-.8611435+04	.1136276+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.2824816+00	.1618501+02	.1000000-01	.1701700-02	.1570699+02	.1000000+00
-.2017984-04	-.5216483-03	.1058580-03	.7610749-03	-.2315778-03	.0000000

-.1149491-02	-.7714438+04	-.1737226-03	-.7866805+04	.2146052+04	.0000000
.1414787-02	-.7866805+04	-.9310776+04	-.1056438+05	.2241364+04	.0000000
.7947619-02	-.1313471+04	-.9435922+04	-.9437926+04	.5370836+04	.0000000
-.3643012-02	.0000000	-.9270249+04	-.2286951+05	.0000000	.0000000
-.3399732-03	.0000000	-.4138930+04	-.1419401+05	.8889186+03	.0000000

THETA ANGLE= .00000 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
.3388370-04	-.6403454-03	.0000000	.1391108-02	-.2666962-03	.0000000
.0000000	-.1381839+05	.0000000	-.1427911+05	.0000000	.0000000
.9802796-03	-.1427911+05	-.1107789+05	-.1276338+05	.0000000	.0000000
.8018078-02	.0000000	-.1922191+05	-.1922523+05	.0000000	.0000000
-.4067498-02	.0000000	-.2596297+05	-.2596323+05	.0000000	.0000000
.0000000	.0000000	-.2907276+04	-.1561849+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.4336512-05	-.5112830-03	-.1106141-03	.9997701-03	-.1908500-03	.0000000
.1114142-02	-.8243965+04	.1384231-03	-.8364405+04	-.2136107+04	.0000000
.1188228-02	-.8364405+04	-.9280792+04	-.1054809+05	-.2212752+04	.0000000
.5977193-02	.2221249+04	-.1394754+05	-.1394992+05	-.4318909+04	.0000000
-.3137160-02	.0000000	-.2567990+05	-.1405629+05	.0000000	.0000000
.2498774-03	.0000000	-.3302585+04	-.1299970+05	-.1036618+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.4620975-04	-.3098101-03	-.1134134-03	.4228495-03	-.8031073-04	.0000000
.7303081-03	-.7064716+03	.8663421-04	-.4160812+03	-.2053729+04	.0000000
.1338965-02	-.4160812+03	-.6192157+04	-.6851115+04	-.2102874+04	.0000000
.2903897-02	.1193387+04	-.6112632+04	-.6113639+04	-.2769332+04	.0000000
-.1678413-02	.0000000	-.1477856+05	-.6178194+04	.0000000	.0000000
.1403399-03	.0000000	-.3367058+04	-.8699167+04	-.1201082+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.1680910-04	-.2640674-03	-.4977670-04	.3661487-03	-.7239987-04	.0000000
-.8132611-04	-.1541595+04	-.1590321-04	-.1421155+04	-.7683053+03	.0000000
.9928976-03	-.1421155+04	-.4871194+04	-.5489281+04	-.7611631+03	.0000000
.2452308-02	-.5335338+03	-.5205299+04	-.5206177+04	.4024650+03	.0000000
-.1333055-02	.0000000	-.8888746+04	-.8349713+04	.0000000	.0000000
-.5140565-04	.0000000	-.2173050+04	-.7257886+04	-.6619668+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
.1624407-04	-.2907146-03	.3869229-09	-.4950282-03	-.9918163-04	.0000000
.3423140-08	-.4339738+04	.4981511-09	-.4459797+04	.5047980-02	.0000000
.7040462-03	-.4459797+04	-.4841768+04	-.9609130+04	.4793051-02	.0000000
.3033120-02	.1149049-01	-.6858468+04	-.6859659+04	-.1436521-01	.0000000
-.1516102-02	.0000000	-.1005472+05	-.1005480+05	.0000000	.0000000
.1184398-08	.0000000	-.1309889+04	-.7498331+04	.6081914-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.1681006-04	-.2640569-03	.4977788-04	.3661457-03	-.7239924-04	.0000000
.8131853-04	-.1541521+04	.1590231-04	-.1421075+04	.7683266+03	.0000000
.9929063-03	-.1421075+04	-.4871201+04	-.5489284+04	.7611849+03	.0000000
.2452296-02	.5335214+03	-.5205262+04	-.5206140+04	-.4024362+03	.0000000
-.1333052-02	.0000000	-.8349565+04	-.8888839+04	.0000000	.0000000
.5140919-04	.0000000	-.2173077+04	-.7257884+04	.6619793+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.4620962-04	-.3098127-03	.1134143-03	.4228560-03	-.8031196-04	.0000000
-.7303256-03	-.7065413+03	-.8663648-04	-.4161533+03	.2053749+04	.0000000
-.1338967-02	-.4161533+03	-.6192203+04	-.6851168+04	.2102895+04	.0000000
.2903933-02	-.1193427+04	-.6112723+04	-.6113738+04	.2769401+04	.0000000
-.1678431-02	.0000000	-.6178145+04	-.1477885+05	.0000000	.0000000
-.1403443-03	.0000000	-.3367070+04	-.8699226+04	.1201087+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.2926918+00	.1677001+02	.1000000-01	.1701700-02	.1625870+02	.1000000+00
-.4335371-05	-.5112871-03	.1106129-03	.9997824-03	-.1908524-03	.0000000
-.1114134-02	-.8244137+04	-.1384222-03	-.8364588+04	.2136086+04	.0000000
.1188222-02	-.8364588+04	-.9280850+04	-.1054816+05	.2212730+04	.0000000
.5977257-02	-.2221236+04	-.1394770+05	-.1395009+05	.4318880+04	.0000000
-.3137189-02	.0000000	-.1405634+05	-.2568024+05	.0000000	.0000000
-.2498759-03	.0000000	-.3302575+04	-.1299978+05	.1036606+04	.0000000

THETA ANGLE= .00000 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
-.4437302-04	-.6063675-03	.0000000	.1821483-02	-.1979286-03	.0000000
.0000000	-.1499045+05	.0000000	-.1529904+05	.0000000	.0000000
.6918627-03	-.1529904+05	-.1110558+05	-.1273235+05	.0000000	.0000000
.5922760-02	.0000000	-.2728467+05	-.2728869+05	.0000000	.0000000
-.3145252-02	.0000000	-.3278308+05	-.3278338+05	.0000000	.0000000

.0000000	.0000000	-.1883240+04	-.1310322+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
.6062640-05	-.4951255-03	-.1164885-03	.1253720-02	-.1454599-03	.0000000
.1069379-02	-.8774748+04	.9492562-04	-.8861925+04	-.2124077+04	.0000000
.9507664-03	-.8861925+04	-.9288855+04	-.1054176+05	-.2177719+04	.0000000
.4340591-02	.3209370+04	-.1878302+05	-.1878581+05	-.3022705+04	.0000000
-.2489628-02	.0000000	-.2855484+05	-.1936486+05	.0000000	.0000000
.1825557-03	.0000000	-.2576064+04	-.1160782+05	-.1218792+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
-.3725943-04	-.3169950-03	-.1149866-03	.4390391-03	-.6764168-04	.0000000
.6918125-03	-.4338881+03	.6332276-04	-.2485841+03	-.2021729+04	.0000000
-.1183494-02	-.2485841+03	-.6185483+04	-.6884779+04	-.2058504+04	.0000000
.1996426-02	.1580697+04	-.6580020+04	-.6581031+04	-.2072299+04	.0000000
-.1429755-02	.0000000	-.1450922+05	-.7260338+04	.0000000	.0000000
.9716712-04	.0000000	-.3082557+04	-.8809243+04	-.1279026+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
-.1104868-04	-.2667534-03	-.4612719-04	.4106844-03	-.5891114-04	.0000000
-.9100403-04	-.1518962+04	-.5373385-05	-.1431786+04	-.7350810+03	.0000000
.8613989-03	-.1431786+04	-.4895949+04	-.5535176+04	-.7334480+03	.0000000
.1738969-02	-.9739088+03	-.6145750+04	-.6146687+04	.9202124+02	.0000000
-.1109434-02	.0000000	-.9974297+04	-.8912963+04	.0000000	.0000000
-.4513971-04	.0000000	-.1939900+04	-.7158530+04	-.5900232+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
.2017328-04	-.2833999-03	.3284123-09	.6292442-03	-.7552973-04	.0000000
.3448241-08	-.4729141+04	.2721098-09	-.4791156+04	.4656515-02	.0000000
.5654839-03	-.4791156+04	-.4893061+04	-.5651959+04	.4520379-02	.0000000
.2243497-02	.1915272-01	-.9412778+04	-.9414182+04	-.7671257-02	.0000000
-.1193369-02	.0000000	-.1225406+05	-.1225417+05	.0000000	.0000000
.9605726-09	.0000000	-.9835874+03	-.6810983+04	.4785429-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
-.1104957-04	-.2667532-03	.4612838-04	.4106790-03	-.5891076-04	.0000000

.9099685-04	-.1518877+04	.5372698-05	-.1431697+04	.7351020+03	.0000000
.8614077-03	-.1431697+04	-.4895954+04	-.5535179+04	.7334694+03	.0000000
.1738958-02	.9738923+03	-.6145670+04	-.6146607+04	-.9199973+02	.0000000
-.1109433-02	.0000000	-.8912781+04	-.9974351+04	.0000000	.0000000
.4513871-04	.0000000	-.1939929+04	-.7158546+04	.5900365+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
-.3725928-04	-.3169974-03	.1149876-03	.4390478-03	-.6764258-04	.0000000
-.6918296-03	-.4339635+03	-.6332424-04	-.2486614+03	.2021749+04	.0000000
.1183495-02	-.2486614+03	-.6185529+04	-.6884831+04	.2058525+04	.0000000
.1996453-02	-.1580759+04	-.6580151+04	-.6581162+04	.2072344+04	.0000000
-.1429769-02	.0000000	-.7260343+04	-.1450951+05	.0000000	.0000000
-.9717047-04	.0000000	-.3082563+04	-.8809290+04	.1279035+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3029020+00	.1735501+02	.1000000-01	.1701700-02	.1680872+02	.1000000+00
.6063788-05	-.4951290-03	.1164873-03	.1253738-02	-.1454615-03	.0000000
-.1069372-02	-.8774940+04	-.9492497-04	-.8862123+04	.2124056+04	.0000000
.9507589+03	-.8862123+04	-.9288914+04	-.1054183+05	.2177697+04	.0000000
.4340640-02	-.3209353+04	-.1878329+05	-.1878608+05	.3022683+04	.0000000
-.2489649-02	.0000000	-.1936496+05	-.2855529+05	.0000000	.0000000
-.1825547-03	.0000000	-.2576044+04	-.1160787+05	.1218779+04	.0000000

THETA ANGLE= .00000 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
.4515428-04	-.5613087-03	.0000000	.2293039-02	-.1224694-03	.0000000
.0000000	-.1619915+05	.0000000	-.1633686+05	.0000000	.0000000
.4076726-03	-.1633686+05	-.1120790+05	-.1272397+05	.0000000	.0000000
.4434462-02	.0000000	-.3612507+05	-.3612985+05	.0000000	.0000000
-.1963639-02	.0000000	-.4030069+05	-.4030102+05	.0000000	.0000000
.0000000	.0000000	-.1046676+04	-.1016948+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
.9885100-05	-.4722289-03	-.1236878-03	.1523081-02	-.9550183-04	.0000000
.1015002-02	-.9306442+04	.4255973-04	-.9359015+04	-.2111657+04	.0000000
.7098428-03	-.9359015+04	-.9340793+04	-.1054601+05	-.2137609+04	.0000000
.3121871-02	.4279982+04	-.2394366+05	-.2394687+05	-.1462415+04	.0000000
-.1691561-02	.0000000	-.3148084+05	-.2521685+05	.0000000	.0000000
.1429159-03	.0000000	-.1989039+04	-.9995432+04	-.1439698+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
-.3045400-04	-.3232244-03	-.1171018-03	.4394337-03	-.5357139-04	.0000000
.6474968-03	-.1243467+03	.3715897-04	-.6098425+02	-.1991482+04	.0000000
.1015653-02	-.6098425+02	-.6181167+04	-.6913050+04	-.2014384+04	.0000000
.1235504-02	.1980648+04	-.6814770+04	-.6815751+04	-.1290501+04	.0000000
-.1176244-02	.0000000	-.1396436+05	-.8221859+04	.0000000	.0000000
.6831671-04	.0000000	-.2864605+04	-.8951353+04	-.1370875+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
-.7424997-05	-.2676329-03	-.4191925-04	.4520719-03	-.4441533-04	.0000000
-.9929894-04	-.1489931+04	.9991055-05	-.1437358+04	-.7047269+03	.0000000
.7222733-03	-.1437358+04	-.4927836+04	-.5578322+04	-.7111622+03	.0000000
.1162872-02	-.1478898+04	-.7051813+04	-.7052799+04	-.3626320+03	.0000000
-.8610885-03	.0000000	-.1116920+05	-.9312239+04	.0000000	.0000000
-.4630066-04	.0000000	-.1760990+04	-.7024971+04	-.4990130+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
.2067349-04	-.2719659-03	.2600307-09	.7783942-03	-.5022199-04	.0000000
.3435244-08	-.5144843+04	-.3378311-10	-.5133855+04	.4301947-02	.0000000
.4252581-03	-.5133855+04	-.4967025+04	-.5698587+04	.4326856-02	.0000000
.1664006-02	.2780450-01	-.1223625+05	-.1223789+05	.1403612-02	.0000000
-.7891734-03	.0000000	-.1469190+05	-.1469204+05	.0000000	.0000000
.8897171-09	.0000000	-.7241875+03	-.5968632+04	.3165926-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
-.7425801-05	-.2676331-03	.4192047-04	.4520637-03	-.4441522-04	.0000000
.9929221-04	-.1489834+04	-.9991441-05	-.1437259+04	.7047475+03	.0000000
.7222820-03	-.1437259+04	-.4927841+04	-.5578324+04	.7111831+03	.0000000
.1162860-02	.1478878+04	-.7051682+04	-.7052668+04	.3626454+03	.0000000
-.8610917-03	.0000000	-.9312018+04	-.1116920+05	.0000000	.0000000
.4629995-04	.0000000	-.1761021+04	-.7025005+04	.4990272+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
-.3045382-04	-.3232266-03	.1171030-03	.4394448-03	-.5357192-04	.0000000
-.6475132-03	-.1244280+03	-.3715945-04	-.6106665+02	.1991503+04	.0000000
.1015653-02	-.6106665+02	-.6181213+04	-.6913102+04	.2014405+04	.0000000
.1235525-02	-.1980733+04	-.6814946+04	-.6815927+04	.1290518+04	.0000000
-.1176252-02	.0000000	-.8221928+04	.1396467+05	.0000000	.0000000

-.6831950-04	.0000000	-.2864607+04	-.8951384+04	.1370888+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3131122+00	.1794001+02	.1000000-01	.1701700-02	.1735698+02	.1000000+00
.9886158-05	-.4722318-03	-.1236865-03	-.1523105-02	-.9550268-04	.0000000
-.1014995-02	-.9306654+04	-.4255935-04	-.9359230+04	.2111636+04	.0000000
.7098339-03	-.9359230+04	-.9340853+04	-.1054608+05	.2137588+04	.0000000
.3121912-02	-.4279961+04	-.2394404+05	-.2394725+05	.1462402+04	.0000000
-.1691570-02	.0000000	-.2521702+05	-.3198141+05	.0000000	.0000000
-.1429152-03	.0000000	-.1989011+04	-.9995441+04	.1439683+04	.0000000

THETA ANGLE= .00000 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
.2408504-04	-.5032565-03	.0000000	.2807754-02	-.4033362+04	.0000000
.0000000	-.1744552+05	.0000000	-.1739305+05	.0000000	.0000000
.1416104-03	-.1739305+05	-.1139674+05	-.1274001+05	.0000000	.0000000
.3709222-02	.0000000	-.4577542+05	-.4578104+05	.0000000	.0000000
-.4983995-03	.0000000	-.4854869+05	-.4854906+05	.0000000	.0000000
.0000000	.0000000	-.4513921+03	-.6764713+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
.5941014-05	-.4416060-03	-.1324246-03	.1807999-02	-.4106620-04	.0000000
.9509394-03	-.9838753+04	-.1936734+04	-.9855397+04	-.2100588+04	.0000000
.4743339-03	-.9855397+04	-.9442828+04	-.1056163+05	-.2093802+04	.0000000
.2410193-02	.5435384+04	-.2943066+05	-.2943431+05	.3824244+03	.0000000
-.7340506-03	.0000000	-.3444418+05	-.3163374+05	.0000000	.0000000
.1362525-03	.0000000	-.1572714+04	-.8138727+04	-.1703726+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
-.2572077-04	-.3287059-03	-.1198042-03	.4222635-03	-.3827933-04	.0000000
.5973259-03	.2236273+03	.8057051-05	.1476172+03	-.1963513+04	.0000000
.8379366-03	.1476172+03	-.6178207+04	-.6935627+04	-.1970992+04	.0000000
.6213283-03	.2392723+04	-.6785337+04	-.6786251+04	-.4214353+03	.0000000
-.9274712-03	.0000000	-.1311489+05	-.9037430+04	.0000000	.0000000
.5545234-04	.0000000	-.2713894+04	-.9137169+04	-.1477409+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
-.6069597-05	-.2666287-03	-.3700423-04	.4901735-03	-.2905007-04	.0000000

-.1061891-03	-.1454701+04	.3076145-04	-.1438056+04	-.6762411+03	.0000000
.5780581-03	-.1438056+04	-.4967779+04	-.5619141+04	-.6936042+03	.0000000
.7377791-03	-.2051530+04	-.7919098+04	-.7920126+04	-.9784158+03	.0000000
-.5898696-03	.0000000	-.1248519+05	-.9529461+04	.0000000	.0000000
-.5783023-04	.0000000	-.1640527+04	-.6856446+04	-.3856492+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
.1709897-04	-.2558011-03	.1794519-09	.9440558-03	-.2334034-04	.0000000
.3383723-08	-.5588577+04	-.4281996-09	-.5489028+04	.3967939-02	.0000000
.2883047-03	-.5489028+04	-.5068054+04	-.5750268+04	.4200700-02	.0000000
.1344056-02	.3748882-01	-.1535329+05	-.1535520+05	.1311608-01	.0000000
-.2945026-03	.0000000	-.1739118+05	-.1739135+05	.0000000	.0000000
.1020200-08	.0000000	-.5473179+03	-.4951330+04	.1172650-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
-.6070262-05	-.2666292-03	.3700547-04	.4901618-03	-.2905025-04	.0000000
.1061829-03	-.1454590+04	-.3076154-04	-.1437947+04	.6762614+03	.0000000
.5780665-03	-.1437947+04	-.4967782+04	-.5619144+04	.6936247+03	.0000000
.7377634-03	.2051505+04	-.7918907+04	-.7919935+04	.9784202+03	.0000000
-.5898784-03	.0000000	-.9529194+04	-.1248514+05	.0000000	.0000000
.5782965-04	.0000000	-.1640559+04	-.6856503+04	.3856646+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
-.2572064-04	-.3287077-03	.1198056-03	.4222772-03	-.3827945-04	.0000000
-.5973415-03	.2235400+03	-.8056313-05	.1475297+03	.1963534+04	.0000000
.8374356-03	.1475297+03	-.6178254+04	-.6935678+04	.1971013+04	.0000000
.6213457-03	-.2392833+04	-.6785561+04	-.6786474+04	.4214153+03	.0000000
-.9274727-03	.0000000	-.9037576+04	-.1311521+05	.0000000	.0000000
-.5545519-04	.0000000	-.2713893+04	-.9137178+04	.1477429+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3233224+00	.1852501+02	.1000000-01	.1701700-02	.1790344+02	.1000000+00
.5941857-05	-.4416080-03	.1324234-03	.1808030-02	-.4106619-04	.0000000
-.9509332-03	-.9838986+04	.1936743-04	-.9855629+04	.2100568+04	.0000000
.4743240-03	-.9855629+04	-.9442891+04	-.1056178+05	.2093781+04	.0000000
.2410233-02	-.5435359+04	-.2943117+05	-.2943482+05	-.3824288+03	.0000000
-.7340439-03	.0000000	-.3163399+05	-.3444490+05	.0000000	.0000000
-.1362520-03	.0000000	-.1572680+04	-.8138688+04	.1703711+04	.0000000

THETA ANGLE= .00000 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
.8849983-05	-.4301507-03	.0000000	.3367661-02	.4896143-04	.0000000
.0000000	-.1873042+05	.0000000	-.1846788+05	.0000000	.0000000
-.8961517-04	-.1846788+05	-.1168490+05	-.1278232+05	.0000000	.0000000
.3917210-02	.0000000	-.5626893+05	-.5627547+05	.0000000	.0000000
.1275880-02	.0000000	-.5756113+05	-.5756155+05	.0000000	.0000000
.0000000	.0000000	-.1556499+03	-.2832668+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.7019641-05	-.4022227-03	-.1429210-03	.2108600-02	.1776172-04	.0000000
.8773075-03	-.1037129+05	-.9157148-04	-.1035070+05	-.2092705+04	.0000000
.2546340-03	-.1035070+05	-.9601522+04	-.1058948+05	-.2047755+04	.0000000
.2299768-02	.6678001+04	-.3524502+05	-.3524914+05	.2532958+04	.0000000
-.3918920-03	.0000000	-.3743060+05	-.3863753+05	.0000000	.0000000
.1682610-03	.0000000	-.1359875+04	-.6012858+04	-.2015441+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.2291400-04	-.3337165-03	-.1231412-03	.3856707-03	-.2192961-04	.0000000
.5413703-03	.6115106+03	-.2406512-04	.3780956+03	-.1938387+04	.0000000
.6506740-03	.3780956+03	-.6175262+04	-.6952225+04	-.1928852+04	.0000000
.1482596-03	.2816454+04	-.6458989+04	-.6459794+04	.5372929+03	.0000000
-.6940738-03	.0000000	-.1193070+05	-.9680449+04	.0000000	.0000000
.6028384-04	.0000000	-.2629277+04	-.9380339+04	-.1599427+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.7104267-05	-.2636801-03	-.3122719-04	.5248435-03	-.1293784-04	.0000000
-.1116904-03	-.1413438+04	.5753753-04	-.1434031+04	-.6485900+03	.0000000
.4314622-03	-.1434031+04	-.5016635+04	-.5658039+04	-.6800557+03	.0000000
.4763363-03	-.2694893+04	-.8743331+04	-.8744392+04	-.1773090+04	.0000000
-.2977091-03	.0000000	-.1393484+05	-.9545861+04	.0000000	.0000000
-.8300559-04	.0000000	-.1582413+04	-.6652356+04	-.2464961+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
.8729974-05	-.2342223-03	.8425126-10	.1127875-02	.5045271-05	.0000000
.3294128-08	-.6061987+04	-.9202166-09	-.5857698+04	.3637551-02	.0000000
.1604636-03	-.5857698+04	-.5200881+04	-.5808225+04	.4129740-02	.0000000
.1338466-02	.4824973-01	-.1878963+05	-.1879184+05	.2773484-01	.0000000
.3006236-03	.0000000	-.2037609+05	-.2037630+05	.0000000	.0000000

.1405469+08	.0000000	-.4703890+03	-.3737120+04	-.1247401-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.7104732-05	-.2636812-03	.3122847-04	.5248278-03	-.1293833-04	.0000000
.1116848-03	-.1413313+04	-.5753728-04	-.1433912+04	.6486101+03	.0000000
.4314699-03	-.1433912+04	-.5016635+04	-.5658041+04	.6800757+03	.0000000
.4763132-03	.2694864+04	-.8743069+04	-.8744130+04	.1773084+04	.0000000
-.2977258-03	.0000000	-.9545542+04	-.1393472+05	.0000000	.0000000
.8300496-04	.0000000	-.1582445+04	-.6652441+04	.2465127+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.2291400-04	-.3337180-03	.1231428-03	.3856871-03	-.2192929-04	.0000000
-.5413849-03	.6114174+03	.2406731-04	.3780028+03	.1938408+04	.0000000
.6506722-03	.3780028+03	-.6175309+04	-.6952276+04	.1928872+04	.0000000
.1482785-03	-.2816591+04	-.6459265+04	-.6460070+04	-.5373563+03	.0000000
-.6940666-03	.0000000	-.9680685+04	-.1193101+05	.0000000	.0000000
-.6028754-04	.0000000	-.2629274+04	-.9380333+04	.1599453+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3335326+00	.1911001+02	.1000000-01	.1701700-02	.1844803+02	.1000000+00
-.7019175-05	-.4022237-03	.1429197-03	.2108639-02	.1776266-04	.0000000
-.8773018-03	-.1037155+05	.9157121-04	-.1035095+05	.2092685+04	.0000000
.2546237-03	-.1035095+05	-.9601589+04	-.1058953+05	.2047735+04	.0000000
.2299818-02	-.6677972+04	-.3524567+05	-.3524979+05	-.2532952+04	.0000000
.3919189-03	.0000000	-.3863787+05	-.3743147+05	.0000000	.0000000
-.1682603-03	.0000000	-.1359840+04	-.6012762+04	.2015424+04	.0000000

THETA ANGLE= .00000 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.9852591-05	-.3872668-03	.0000000	.3665210-02	.9534975-04	.0000000
.0000000	-.1938754+05	.0000000	-.1901232+05	.0000000	.0000000
-.1861177-03	-.1901232+05	-.1187049+05	-.1281394+05	.0000000	.0000000
.4428364-02	.0000000	-.6184246+05	-.6184948+05	.0000000	.0000000
.2287175-02	.0000000	-.6236497+05	-.6236540+05	.0000000	.0000000
.0000000	.0000000	-.1395872+03	-.6502936+03	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.1728864-04	-.3789097-03	-.1489012-03	.2264817-02	.4879713-04	.0000000

.8370028-03	-.1063750+05	-.1317578-03	-.1059780+05	-.2090561+04	.0000000
.1543949-03	-.1059780+05	-.9704261+04	-.1060828+05	-.2024374+04	.0000000
.2500854-02	.7332803+04	-.3827521+05	-.3827957+05	.3729665+04	.0000000
.1020853-02	.0000000	-.3892782+05	-.4236654+05	.0000000	.0000000
.2006596-03	.0000000	-.1340454+04	-.4840931+04	-.2190659+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.2216608-04	-.3361922-03	-.1250631-03	.3579868-03	-.1340569-04	.0000000
.5112783-03	.8208810+03	-.4128362-04	.5018060+03	-.1927078+04	.0000000
.5545884-03	.5018060+03	-.6173272+04	-.6958194+04	-.1908427+04	.0000000
-.3886767-04	.3032553+04	-.6173913+04	-.6174648+04	.1051002+04	.0000000
-.5867622-03	.0000000	-.1120338+05	-.9928586+04	.0000000	.0000000
.6988194-04	.0000000	-.2610855+04	-.9528277+04	-.1666497+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.8553089-05	-.2614599-03	-.2796498-04	.5408443-03	-.4636328-05	.0000000
-.1139425-03	-.1390587+04	.7337303-04	-.1430285+04	-.6347412+03	.0000000
.3581611-03	-.1430285+04	-.5044657+04	-.5676888+04	-.6745513+03	.0000000
.4106188-03	-.3044080+04	-.9137993+04	-.9139068+04	-.2243295+04	.0000000
-.1444029-03	.0000000	-.1471394+05	-.9472693+04	.0000000	.0000000
-.1018302-03	.0000000	-.1577869+04	-.6536837+04	-.1661297+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.2501133-05	-.2211684-03	-.3037836-10	-.1227128-02	.1978283-04	.0000000
.3235547-08	-.6310314+04	-.1205776-08	-.6047385+04	.3468190-02	.0000000
-.1020568-03	-.6047385+04	-.5280798+04	-.5839934+04	.4110983-02	.0000000
.1472299-02	.5404792-01	-.2063592+05	-.2063830+05	.3622142-01	.0000000
-.6392366-03	.0000000	-.2198355+05	-.2198378+05	.0000000	.0000000
.1711794-08	.0000000	-.4753659+03	-.3048742+04	-.2634710-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.8553429-05	-.2614612-03	-.2796628-04	.5408264-03	-.4636978-05	.0000000
.1139372-03	-.1390454+04	-.7337261-04	-.1430161+04	.6347612+03	.0000000
.3581683-03	-.1430161+04	-.5044656+04	-.5676890+04	.6745711+03	.0000000
.4105902-03	.3044048+04	-.9137692+04	-.9138767+04	.2243285+04	.0000000
-.1444244-03	.0000000	-.9472344+04	-.1471378+05	.0000000	.0000000
.1018295-03	.0000000	-.1577901+04	-.6536937+04	.1661470+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.2216617-04	-.3361534-03	.1250648-03	.3595048-03	-.1340513-04	.0000000
-.5112923-03	.8207848+03	.4128664-04	.5017106+03	.1927100+04	.0000000
.5545863-03	.5017106+03	-.6173320+04	-.6958245+04	.1908447+04	.0000000
-.3884593-04	-.3032705+04	-.6174216+04	-.6174951+04	-.1051090+04	.0000000
-.5867501-03	.0000000	-.9928870+04	-.1120369+05	.0000000	.0000000
-.6988640-04	.0000000	-.2610852+04	-.9528259+04	.1666527+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3386377+00	.1940251+02	.1000000-01	.1701700-02	.1871961+02	.1000000+00
-.1728844-04	-.3789101-03	.1488999-03	.2264860-02	.4879857-04	.0000000
-.8369975-03	-.1063777+05	.1317574-03	-.1059806+05	.2090542+04	.0000000
.1543846-03	-.1059806+05	-.9704330+04	-.1060832+05	.2024354+04	.0000000
.2500913-02	-.7332771+04	-.3827594+05	-.3828030+05	-.3729654+04	.0000000
-.1020892-02	.0000000	-.4236694+05	-.3892877+05	.0000000	.0000000
-.2006588-03	.0000000	-.1340419+04	-.4840806+04	.2190642+04	.0000000

THETA ANGLE= .00000 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.1706765-04	-.3719650-03	.8000000	-.3767054-02	.1113457-03	.0000000
.0000000	-.1960875+05	.0000000	-.1919482+05	.0000000	.0000000
-.2147883-03	-.1919482+05	-.1193893+05	-.1282609+05	.0000000	.0000000
.4665004-02	.0000000	-.6374958+05	-.6375678+05	.0000000	.0000000
.2643469-02	.0000000	-.6401126+05	-.6401170+05	.0000000	.0000000
.0000000	.0000000	-.1557811+03	.1110553+03	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.2131401-04	-.3705689-03	-.1510102-03	.2317762-02	.5937887-04	.0000000
.8230681-03	-.1072620+05	-.1457802-03	-.1068006+05	-.2090176+04	.0000000
-.1228066-03	-.1068006+05	-.9742187+04	-.1061526+05	-.2016578+04	.0000000
.2608990-02	.7556087+04	-.3930341+05	-.3930785+05	.4147201+04	.0000000
-.1240540-02	.0000000	-.3942696+05	-.4364376+05	.0000000	.0000000
.2140820-03	.0000000	-.1347958+04	-.4433370+04	-.2252078+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.2200557-04	-.3369658-03	-.1257427-03	.3495294-03	-.1051742-04	.0000000
.5009437-03	.8929949+03	-.4719635-04	.5443192+03	-.1923515+04	.0000000
-.5222051-03	.5443192+03	-.6172473+04	-.6959030+04	-.1901733+04	.0000000
-.9440552-04	.3105192+04	-.6059773+04	-.6060482+04	.1227377+04	.0000000
-.5527668-03	.0000000	-.1093996+05	-.9999537+04	.0000000	.0000000

.7419972-04	.0000000	-.2608121+04	-.9582010+04	-.1689775+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.9177211-05	-.2606079-03	-.2681719-04	.5459749-03	-.1836296-05	.0000000
-.1146231-03	-.1382646+04	.7903341-04	-.1428783+04	-.6300875+03	.0000000
.3338203-03	-.1428783+04	-.5054552+04	-.5683093+04	-.6728807+03	.0000000
.3986786-03	-.3164635+04	-.9266821+04	-.9267899+04	-.2411397+04	.0000000
-.9229961-04	.0000000	-.1498207+05	-.9435639+04	.0000000	.0000000
-.1091463-03	.0000000	-.1580091+04	-.6496329+04	-.1376314+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
.9621315-07	-.2164574-03	-.1141287-10	.1261350-02	.2477378-04	.0000000
.3214063-08	-.6394850+04	-.1307111-08	-.6111427+04	.3410557-02	.0000000
.8363582-04	-.6111427+04	-.5309598+04	-.5850944+04	.4106799-02	.0000000
.1539125-02	.5604372-01	-.2127113+05	-.2127356+05	.3923324-01	.0000000
.7585303-03	.0000000	-.2253715+05	-.2253739+05	.0000000	.0000000
.1832637-08	.0000000	-.4840902+03	-.2806490+04	-.3125116-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.9177499-05	-.2606093-03	.2681850-04	.5459562-03	-.1837001-05	.0000000
.1146179-03	-.1382511+04	-.7903292-04	-.1428657+04	.6301075+03	.0000000
.3338274-03	-.1428657+04	-.5054551+04	-.5683095+04	.6729005+03	.0000000
.3986479-03	.3164603+04	-.9266506+04	-.9267584+04	.2411384+04	.0000000
-.9232292-04	.0000000	-.9435280+04	-.1498190+05	.0000000	.0000000
.1091455-03	.0000000	-.1580123+04	-.6496435+04	.1376489+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.2200570-04	-.3369670-03	.1257445-03	.3495478-03	-.1051678-04	.0000000
-.5009575-03	.8928978+03	.4719966-04	.5442229+03	.1923536+04	.0000000
.5222029-03	.5442229+03	-.6172521+04	-.6959881+04	.1901753+04	.0000000
-.9438253-04	-.3105350+04	-.6060086+04	-.6060795+04	-.1227474+04	.0000000
-.5527529-03	.0000000	-.9999839+04	-.1094027+05	.0000000	.0000000
-.7420447-04	.0000000	-.2608119+04	-.9581989+04	.1689806+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1881001+02	.1000000+00
-.2131391-04	-.3705690-03	.1510089-03	.2317807-02	.5938047-04	.0000000

-.8230629-03	-.1072647+05	.1457797-03	-.1068032+05	.2090156+04	.0000000
-.1227964-03	-.1068032+05	-.9742258+04	-.1061533+05	.2016559+04	.0000000
.2609053-02	-.7556055+04	-.3930416+05	-.3930860+05	-.4147188+04	.0000000
.1240582-02	.0000000	-.4364417+05	-.3942794+05	.0000000	.0000000
-.2140812-03	.0000000	-.1347923+04	-.4433234+04	.2252060+04	.0000000

REGION NUMBER 2

THERE ARE 2 SEGMENTS AND 0 KINEMATIC LINKS WITHIN THIS REGION

SEGMENT NUMBER 1 SEGMENT CODE 11 FIRST PART OF REG. NO. 2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.3403392+00	.5105088+00
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.5236000+00	.5236000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

-.1000000+04	.1000000+04				
PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
EPSILON THETA	EPSILON PHI	GAMMA PHI THETA	K PHI	K THETA	N TEMPERATURE THETA
U	Q PHI	K PHI THETA	J PHI STAR	T PHI THETA	N TEMPERATURE PHI
V	J PHI	N THETA	N PHI	N PHI THETA	M TEMPERATURE THETA
W	Q THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE PHI
OMEGA THETA	TAU ZETA PHI = Q/T	SIGMA THETA IN	SIGMA PHI IN	TAU PHI THETA IN	SIGMA F IN
OMEGA PHI	TAU ZETA THETA = Q/T	SIGMA THETA OUT	SIGMA PHI OUT	TAU PHI THETA OUT	SIGMA F OUT

THETA ANGLE= .00000 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.1731721-04	-.1860386-03	.0000000	.1586506-02	.1116613-03	.0000000
.0000000	.2706675+05	.0000000	.2747958+05	.0000000	.0000000
-.2324657-03	.2747958+05	-.5928461+04	-.1498727+05	.0000000	.0000000
.4624457-02	.0000000	-.2529912+05	-.6413469+05	.0000000	.0000000
.2643469-02	.0000000	-.2805250+05	-.7075326+05	.0000000	.0000000
.0000000	.0000000	-.3633963+03	-.8943194+03	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.2142778-04	-.1148360-03	.3781887-03	.9802569-03	.5945774+04	.0000000
.8223377-03	.1537049+05	-.1413382-03	.1542350+05	.6151417+04	.0000000
.1145106-03	.1542350+05	-.4109407+04	-.9395531+04	.6225502+04	.0000000

.2589960-02	.2868739+04	-.1530105+05	-.3951649+05	.4171019+04	.0000000
.1240539-02	.0000000	-.1737790+05	-.4372757+05	.0000000	.0000000
.2119019-03	.0000000	-.5888770+03	-.6220844+03	.4374013+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.2194599-04	-.1842221-04	-.1937306-03	-.1559227-03	-.1070647+04	.0000000
.5004992-03	-.6224072+02	-.4444198-04	-.4001156+03	.3091406+04	.0000000
.5259011-03	-.4001156+03	-.1415589+04	-.1739326+04	.3116427+04	.0000000
-.8592976-04	.1179924+04	-.1719099+04	-.6048094+04	.1408709+04	.0000000
-.5527675-03	.0000000	-.2702828+04	-.6940399+04	.0000000	.0000000
.7350429-04	.0000000	-.7369571+03	-.2322895+03	.2310527+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.9162813-05	-.2875910-04	-.1042103-03	.2356628-03	-.1864102-05	.0000000
-.1145214-03	.2613264+04	.7848677-04	.2560263+04	-.1779475+04	.0000000
.3344373-03	.2560263+04	-.1122765+04	-.2346975+04	-.1818174+04	.0000000
.4000931-03	-.1200056+04	-.3064840+04	-.9299704+04	-.2178774+04	.0000000
-.9229983-04	.0000000	-.3719385+04	-.1039959+05	.0000000	.0000000
-.1079496-03	.0000000	-.3246184+03	-.2207084+03	-.1106412+04	.0000000

THETA ANGLE= 3.14160 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
.2789579-07	-.6430658-04	.2124346-08	.5334831-03	.2493846-04	.0000000
.3211211-08	.9025144+04	-.1290669-08	.9288059+04	.3561436-01	.0000000
.7856332-04	.9288059+04	-.1704694+04	-.5019042+04	.3626022-01	.0000000
.1527490-02	.2125959-01	-.7994381+04	-.2140135+05	.3636214-01	.0000000
.7685304-03	.0000000	-.8713631+04	-.2362005+05	.0000000	.0000000
.1812904-08	.0000000	.1031522+02	-.3266651+03	.2332765-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.9163098-05	-.2875816-04	-.1042083-03	.2356550-03	-.1864813-05	.0000000
.1145162-03	.2613091+04	-.7848631-04	.2560081+04	.1779443+04	.0000000
.3344446-03	.2560081+04	-.1122752+04	-.2346904+04	.1818142+04	.0000000
.4000627-03	.1200044+04	-.3064711+04	-.9299387+04	.2178759+04	.0000000
-.9232315-04	.0000000	-.3719255+04	-.1039925+05	.0000000	.0000000
.1079489-03	.0000000	-.3246285+03	-.2207057+03	.1106388+04	.0000000

THETA ANGLE= 4.71240 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.2194612-04	-.1842310-04	-.1937377-03	.1559305-03	-.1070583-04	.0000000
-.5005130-03	-.6210815+02	.4444522-04	-.3999818+03	-.3091523+04	.0000000
.5258988-03	-.3999818+03	-.1415620+04	-.1739400+04	-.3116546+04	.0000000
-.8590698-04	-.1179984+04	-.1719226+04	-.6048408+04	-.1408803+04	.0000000
-.5527536-03	.0000000	-.2702970+04	-.6940745+04	.0000000	.0000000
-.7350900-04	.0000000	-.7369599+03	-.2322937+03	-.2310608+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3403392+00	.1950000+02	.1000000-01	.1701700-02	.1879332+02	.3000000+00
-.2142767-04	-.1148382-03	-.3781867-03	.9802756-03	.5945935-04	.0000000
-.8223325-03	.1537085+05	.1413378-03	.1542387+05	-.6151384+04	.0000000
.1145002-03	.1542387+05	-.4109464+04	-.9395704+04	-.6225470+04	.0000000
.2590022-02	-.2868727+04	-.1530136+05	-.3951725+05	-.4171004+04	.0000000
.1240582-02	.0000000	-.1737823+05	-.4372841+05	.0000000	.0000000
-.2119011-03	.0000000	-.5888706+03	-.6220928+03	-.4373989+04	.0000000

THETA ANGLE= .00000 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.3378982-04	-.2113604-03	.0000000	.1176179-02	.1381210-03	.0000000
.0000000	.2468757+05	.0000000	.2514460+05	.0000000	.0000000
-.2911774-03	.2514460+05	-.6604052+04	-.1480222+05	.0000000	.0000000
.6385520-02	.0000000	-.2109330+05	-.4858018+05	.0000000	.0000000
.3435120-02	.0000000	-.2472428+05	-.5630695+05	.0000000	.0000000
.0000000	.0000000	-.1210195+04	-.3054316+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.3500261-04	-.1256089-03	.3458989-03	.7406571-03	.8051867-04	.0000000
.1034506-02	.1408858+05	-.1657561-03	.1414978+05	.5704127+04	.0000000
.7585213-04	.1414978+05	-.4647515+04	-.9169619+04	.5788759+04	.0000000
.3450477-02	.2094903+04	-.1307440+05	-.3049632+05	.4764792+04	.0000000
.1733849-02	.0000000	-.1575514+05	-.3525990+05	.0000000	.0000000
.2988591-03	.0000000	-.1164356+04	-.1779167+04	.3909345+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.2997949-04	-.1135429-04	.1772214-03	.1442033-03	.8477614-06	.0000000
.6179506-03	.7517017+02	-.5543862-04	-.2953018+03	.2859538+04	.0000000
.5149628-03	-.2953018+03	-.1708027+04	-.1503446+04	.2889264+04	.0000000
-.3838481-03	.8903782+03	-.2039890+04	-.5723725+04	.1673560+04	.0000000
-.4664088-03	.0000000	-.3222130+04	-.6462690+04	.0000000	.0000000
.1013152-03	.0000000	-.9150471+03	-.9102825+02	.2076671+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.1371199-04	-.2829270-04	-.9526816-04	.1911975-03	.5171626-05	.0000000
-.1605876-03	.2430970+04	.8735292-04	.2369766+04	-.1660099+04	.0000000
.3219557-03	.2369766+04	-.1291499+04	-.2226520+04	-.1702692+04	.0000000
.3801145-03	-.8357051+03	-.2778406+04	-.7659422+04	-.2397987+04	.0000000
.3018795-04	.0000000	-.3587182+04	-.8799052+04	.0000000	.0000000
-.1555757-03	.0000000	-.4696693+03	-.3691223+03	-.9724697+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.3680514-05	-.7373343-04	-.1942407-08	.3991202-03	.3156356-04	.0000000
.4247252-08	.8201085+04	-.1454685-08	.8484996+04	.3315054-01	.0000000
.5687149-04	.8484996+04	-.1857911+04	-.4983123+04	.3386805-01	.0000000
.2043332-02	.1501432-01	-.6532469+04	-.1628371+05	.4039595-01	.0000000
.1025756-02	.0000000	-.7516062+04	-.1888540+05	.0000000	.0000000
.2598658-08	.0000000	-.2277637+03	-.1060195+04	.2064338-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.1371231-04	-.2829149-04	.9526632-04	.1911921-03	.5170946-05	.0000000
.1605812-03	.2430815+04	-.8735235-04	.2369601+04	.1660069+04	.0000000
.3219631-03	.2369601+04	-.1291487+04	-.2226448+04	.1702662+04	.0000000
.3800695-03	.8356958+03	-.2778309+04	-.7659197+04	.2397970+04	.0000000
.3016084-04	.0000000	-.3587082+04	-.8798789+04	.0000000	.0000000
.1555746-03	.0000000	-.4696772+03	-.3691038+03	.9724481+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.2997971-04	-.1135530-04	-.1772279-03	.1442090-03	.8485458-06	.0000000
-.6179682-03	.7529138+02	.5544234-04	-.2951792+03	-.2859646+04	.0000000
.5149602-03	-.2951792+03	-.1708062+04	-.1503518+04	-.2889374+04	.0000000
-.3838161-03	-.8904213+03	-.2039997+04	-.5723963+04	-.1673665+04	.0000000
-.4663911-03	.0000000	-.3222257+04	-.6462965+04	.0000000	.0000000
-.1013219-03	.0000000	-.9150544+03	-.9104290+02	-.2076742+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3505494+00	.2008500+02	.1000000-01	.1701700-02	.1933420+02	.3000000+00
-.3500260-04	-.1256115-03	-.3458970-03	.7406706-03	.8052045-04	.0000000
-.1034500-02	.1408890+05	.1657556-03	.1415012+05	-.5704097+04	.0000000
.7584104-04	.1415012+05	-.4647577+04	-.9169793+04	-.5788729+04	.0000000

.3450567-02	-.2094894+04	-.1307465+05	-.3049688+05	-.4764774+04	.0000000
.1733901-02	.0000000	-.1575542+05	-.3526055+05	.0000000	.0000000
-.2988580-03	.0000000	-.1164358+04	-.1779206+04	-.3909324+04	.0000000

THETA ANGLE= .00000 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.5883680-04	-.2308979-03	.0000000	.8131498-03	.1514362-03	.0000000
.0000000	.2244433+05	.0000000	.2291594+05	.0000000	.0000000
-.3426315-03	.2291594+05	-.7595229+04	-.1464494+05	.0000000	.0000000
.8537103-02	.0000000	-.1701529+05	-.3468983+05	.0000000	.0000000
.4004742-02	.0000000	-.2175718+05	-.4341909+05	.0000000	.0000000
.0000000	.0000000	-.2300305+04	-.4947548+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.5304203-04	-.1336881-03	.3165953-03	.5271940-03	.9395766-04	.0000000
.1233281-02	.1286460+05	-.1786827-03	.1292939+05	.5278485+04	.0000000
.4191308-04	.1292939+05	-.5353407+04	-.8977430+04	.5368419+04	.0000000
.4556826-02	.1427153+04	-.1090398+05	-.2239268+05	.5063267+04	.0000000
.2097055-02	.0000000	-.1431388+05	-.2766481+05	.0000000	.0000000
.3965057-03	.0000000	-.1870000+04	-.2803062+04	.3510734+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.3723413-04	-.5438393-05	.1619614-03	.1309972-03	.1212653-04	.0000000
.7285625-03	.1760676+03	-.6185747-04	-.2039154+03	.2637215+04	.0000000
.5049512-03	-.2039154+03	-.1978645+04	-.1302418+04	.2669557+04	.0000000
-.6340503-03	.6385618+03	-.2329057+04	-.5341214+04	.1820851+04	.0000000
-.3872643-03	.0000000	-.3695997+04	-.5958244+04	.0000000	.0000000
.1341251-03	.0000000	-.1077788+04	.1428229+02	.1869874+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.1885512-04	-.2771028-04	-.8754560-04	.1508059-03	.1081224-04	.0000000
-.2029329-03	.2250401+04	.9120174+04	.2185616+04	-.1548871+04	.0000000
.3099100-03	.2185618+04	-.1485296+04	-.2123340+04	-.1593066+04	.0000000
.4235521-03	-.5240815+03	-.2492646+04	-.6160348+04	-.2488159+04	.0000000
.1282946-03	.0000000	-.3475169+04	-.7342339+04	.0000000	.0000000
-.2068214-03	.0000000	-.6343699+03	-.5057647+03	-.8663157+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.1048934-04	-.8102127-04	-.1782228-08	.2808532-03	.3385017-04	.0000000
.5207677-08	.7433455+04	-.1530900-08	.7721812+04	.3083576-01	.0000000
.3637956-04	.7721812+04	-.2124874+04	-.4951720+04	.3158482-01	.0000000
.2691717-02	.9660128-02	-.5119800+04	-.1173370+05	.4217211-01	.0000000
.1220468-02	.0000000	-.6428858+04	-.1467859+05	.0000000	.0000000
.3452925-08	.0000000	-.5528596+03	-.1698650+04	.1845059-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.1885541-04	-.2770884-04	-.8754392-04	.1508025-03	.1081167-04	.0000000
.2029253-03	.2250262+04	-.9120110-04	.2185466+04	.1548844+04	.0000000
.3099177-03	-.2185466+04	-.1485282+04	-.2123266+04	.1593038+04	.0000000
.4234907-03	.5240749+03	-.2492579+04	-.6160204+04	.2488140+04	.0000000
.1282650-03	.0000000	-.3475096+04	-.7342149+04	.0000000	.0000000
.2068200-03	.0000000	-.6343739+03	-.5057325+03	.8662963+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.3723448-04	-.5439495-05	-.1619673-03	-.1310011-03	.1212739-04	.0000000
-.7285836-03	.1761780+03	.6186144-04	-.2038036+03	-.2637316+04	.0000000
.5049484-03	-.2038036+03	-.1978685+04	-.1302489+04	-.2669659+04	.0000000
-.6340074-03	-.6385905+03	-.2329144+04	-.5341383+04	-.1820963+04	.0000000
-.3872438-03	.0000000	-.3696110+04	-.5958455+04	.0000000	.0000000
-.1341340-03	.0000000	-.1077801+04	.1425842+02	-.1869938+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3607596+00	.2067000+02	.1000000-01	.1701700-02	.1987306+02	.3000000+00
-.5304224-04	-.1336911-03	-.3165936-03	.5272029-03	.9395945-04	.0000000
-.1233274-02	.1286490+05	.1786820-03	.1292970+05	-.5278458+04	.0000000
.4190145-04	-.1292970+05	-.5353478+04	-.8977605+04	-.5368391+04	.0000000
.4556948-02	-.1427146+04	-.1090417+05	-.2239306+05	-.5063248+04	.0000000
.2097114-02	.0000000	-.1431411+05	-.2766529+05	.0000000	.0000000
-.3965043-03	.0000000	-.1870014+04	-.2803128+04	-.3510715+04	.0000000

THETA ANGLE= .00000 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.8980906-04	-.2459265-03	.0000000	.4926698-03	.1544686-03	.0000000
.0000000	.2032395+05	.0000000	.2078830+05	.0000000	.0000000
-.3805216-03	-.2078830+05	-.8805345+04	-.1452060+05	.0000000	.0000000
.1095901-01	.0000000	-.1310640+05	-.2231695+05	.0000000	.0000000
.4378121-02	.0000000	-.1911445+05	-.3195708+05	.0000000	.0000000
.0000000	.0000000	-.3552940+04	-.6610372+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.7411038-04	-.1397011-03	.2893305-03	.3376430-03	.1011837-03	.0000000
.1419720-02	.1169501+05	-.1824787-03	.1175991+05	.4864880+04	.0000000
.1619775-04	.1175991+05	-.6173697+04	-.8820054+04	.4955940+04	.0000000
.5838343-02	.8526415+03	-.8811087+04	-.1513763+05	.5126680+04	.0000000
.2344528-02	.0000000	-.1303231+05	-.2087971+05	.0000000	.0000000
.4989320-03	.0000000	-.2661855+04	-.3710476+04	.3160435+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.4384717-04	-.4865550-06	.1476063-03	-.1172044-03	.2271606-04	.0000000
.8327433-03	.2477202+03	-.6459291-04	-.1248405+03	.2421022+04	.0000000
.4957261-03	-.1248405+03	-.2230530+04	-.1132668+04	.2454298+04	.0000000
-.8408843-03	.4203393+03	-.2582439+04	-.4929760+04	.1873421+04	.0000000
-.3159163-03	.0000000	-.4122901+04	-.5451215+04	.0000000	.0000000
.1695660-03	.0000000	-.1229025+04	.9121169+02	.1683596+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.2438395-04	-.2706797-04	-.8058218-04	.1143119-03	.1520389-04	.0000000
-.2420368-03	.2072512+04	.9112931-04	.2007609+04	-.1441011+04	.0000000
.2989288-03	.2007609+04	-.1695877+04	-.2036511+04	-.1485011+04	.0000000
.5170466-03	-.2581873+03	-.2210238+04	-.4797458+04	-.2477228+04	.0000000
.2043116-03	.0000000	-.3379366+04	-.6023972+04	.0000000	.0000000
-.2591260-03	.0000000	-.8122161+03	-.6315468+03	-.7794540+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.1948529-04	-.8663766-04	.1635979-08	.1768301-03	.3287421-04	.0000000
.6100791-08	.6715572+04	-.1538172-08	.6996341+04	.2858922-01	.0000000
.1932678-04	.6996341+04	-.2472727+04	-.4927148+04	.2933827-01	.0000000
.3433490-02	.5081397-02	-.3771344+04	-.7693657+04	.4217146-01	.0000000
.1351371-02	.0000000	-.5463064+04	-.1094777+05	.0000000	.0000000
.4330797-08	.0000000	-.9371499+03	-.2256070+04	.1660431-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.2438416-04	-.2706636-04	.8058065-04	.1143103-03	.1520348-04	.0000000
.2420281-03	.2072388+04	-.9112864-04	.2007475+04	.1440986+04	.0000000
.2989366-03	.2007475+04	-.1695860+04	-.2036435+04	.1484986+04	.0000000

.5169676-03	.2581829+03	-.2210200+04	-.4797386+04	.2477209+04	.0000000
.2042806-03	.0000000	-.3379317+04	-.6023846+04	.0000000	.0000000
.2591242-03	.0000000	-.8122148+03	-.6315028+03	.7794365+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.4384769-04	-.4877267-06	-.1476117-03	.1172067-03	.2271696-04	.0000000
-.8327677-03	.2478203+03	.6459694+04	-.1247391+03	-.2421115+04	.0000000
.4957231-03	-.1247391+03	-.2230577+04	-.1132738+04	-.2454393+04	.0000000
-.8408290-03	-.4203557+03	-.2582508+04	-.4929868+04	-.1873533+04	.0000000
-.3158941-03	.0000000	-.4123002+04	-.5451370+04	.0000000	.0000000
-.1695772-03	.0000000	-.1229044+04	.9117966+02	-.1683654+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3709697+00	.2125500+02	.1000000-01	.1701700-02	.2040984+02	.3000000+00
-.7411090-04	-.1397044-03	-.2893290-03	.3376479-03	.1011854-03	.0000000
-.1419711-02	.1169527+05	.1824781-03	.1176019+05	-.4864855+04	.0000000
.1618574-04	.1176019+05	-.6173780+04	-.8820230+04	-.4955915+04	.0000000
.5838500-02	-.8526372+03	-.8811221+04	-.1513785+05	-.5126660+04	.0000000
.2344590-02	.0000000	-.1303250+05	-.2088005+05	.0000000	.0000000
-.4989302-03	.0000000	-.2661884+04	-.3710565+04	-.3160417+04	.0000000

THETA ANGLE= .00000 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.1244684-03	-.2574751-03	.0000000	.2107014-03	.1495485-03	.0000000
.0000000	.1831474+05	.0000000	.1875601+05	.0000000	.0000000
-.4003553-03	.1875601+05	-.1015168+05	-.1443115+05	.0000000	.0000000
.1354507-01	.0000000	-.9397696+04	-.1133532+05	.0000000	.0000000
.4578525-02	.0000000	-.1676057+05	-.2180488+05	.0000000	.0000000
.0000000	.0000000	-.4899830+04	-.8072114+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.9698083-04	-.1441600-03	.2634435-03	.1700538-03	.1033821-03	.0000000
.1594616-02	.1057634+05	-.1790686-03	.1063881+05	.4457194+04	.0000000
.1203233-05	.1063881+05	-.7062284+04	-.8697115+04	.4546080+04	.0000000
.7232243-02	.3603861+03	-.6812508+04	-.8670839+04	.5004267+04	.0000000
.2489440-02	.0000000	-.1189014+05	-.1484801+05	.0000000	.0000000
.6014556-03	.0000000	-.3502298+04	-.4515097+04	.2845373+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.4990845-04	.3642031-05	.1339133-03	.1034789-03	.3235063-04	.0000000
.9308093-03	.2961329+03	-.6438604+04	-.5679291+02	.2208786+04	.0000000
.4871952-03	-.5679291+02	-.2465553+04	-.9913098+03	.2241680+04	.0000000
-.1008897-02	.2321013+03	-.2798335+04	-.4511005+04	.1850247+04	.0000000
-.2529040-03	.0000000	-.4502656+04	-.4959318+04	.0000000	.0000000
.2057385-03	.0000000	-.1371106+04	.1454763+03	.1512951+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.3011416-04	-.2641364-04	-.7406014-04	.8153220-04	.1848731-04	.0000000
-.2782459-03	.1898026+04	.8801172-04	.1835563+04	-.1333474+04	.0000000
.2894805-03	.1835563+04	-.1915900+04	-.1965042+04	-.1375883+04	.0000000
.6485205-03	-.3214392+02	-.1933635+04	-.3565379+04	-.2387589+04	.0000000
.2604270-03	.0000000	-.3296317+04	-.4838107+04	.0000000	.0000000
-.3104933-03	.0000000	-.9974222+03	-.7472970+03	-.7057225+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.2990457-04	-.9095511-04	.1498246-08	.8551272-04	.2948877-04	.0000000
.6932660-08	.6041654+04	-.1491656-08	.6306237+04	.2635951-01	.0000000
.7336719-05	.6306237+04	-.2873564+04	-.4910492+04	.2708387-01	.0000000
.4234194-02	.1180606-02	-.2497908+04	-.4115083+04	.4078148-01	.0000000
.1426197-02	.0000000	-.4607017+04	-.7648867+04	.0000000	.0000000
.5197104-08	.0000000	-.1357389+04	-.2743593+04	.1499894-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.3011425-04	-.2641189-04	.7405875-04	.8153220-04	.1848709-04	.0000000
.2782363-03	.1897915+04	-.8801106-04	.1835442+04	.1333451+04	.0000000
.2894884-03	.1835442+04	-.1915878+04	-.1964964+04	.1375859+04	.0000000
.6484235-03	.3214150+02	-.1933625+04	-.3565368+04	.2387570+04	.0000000
.2603956-03	.0000000	-.3296289+04	-.4838038+04	.0000000	.0000000
.3104912-03	.0000000	-.9974148+03	-.7472431+03	.7057068+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3811799+00	.2184000+02	.1000000-01	.1701700-02	.2094450+02	.3000000+00
-.4990915-04	.3640807-05	-.1339182-03	.1034798-03	.3235152-04	.0000000
-.9308368-03	.2962231+03	.6438997-04	-.5670135+02	-.2208871+04	.0000000
-.4871922-03	-.5670135+02	-.2465606+04	-.9913792+03	-.2241737+04	.0000000
-.1008829-02	-.2321070+03	-.2798385+04	-.4511058+04	-.1850356+04	.0000000
-.2524808-03	.0000000	-.4502745+04	-.4959422+04	.0000000	.0000000
-.2057519-03	.0000000	-.1371132+04	.1454371+03	-.1513003+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3811799+00	.2184000+02	.1000000+01	.1701700-02	.2094450+02	.3000000+00
-.9698171-04	-.1441634-03	-.2634421-03	-.1700551-03	-.1033835-03	.0000000
-.1594607-02	.1057658+05	.1790679-03	.1063905+05	-.4457171+04	.0000000
.1191073-05	.1063905+05	-.7062381+04	-.8697291+04	-.4546056+04	.0000000
.7232437-02	-.3603837+03	-.6812590+04	-.8670923+04	-.5004248+04	.0000000
.2489504-02	.0000000	-.1189030+05	-.1484823+05	.0000000	.0000000
-.6014535-03	.0000000	-.3502342+04	-.4515206+04	-.2845357+04	.0000000

THETA ANGLE= .00000 RADIANS

.3913901+00	.2242500+02	.1000000+01	.1701700-02	.2147697+02	.3000000+00
-.1609244-03	-.2663736-03	.0000000	-.3620415-04	.1385792-03	.0000000
.0000000	.1640612+05	.0000000	.1681312+05	.0000000	.0000000
-.3991908-03	.1681312+05	-.1156349+05	-.1437624+05	.0000000	.0000000
.1620181-01	.0000000	-.5912354+04	-.1635845+04	.0000000	.0000000
.4627073-02	.0000000	-.1466200+05	-.1286060+05	.0000000	.0000000
.0000000	.0000000	-.6283289+04	-.9356479+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.1206078-03	-.1474810-03	.2384989-03	.2271021-04	.1015523-03	.0000000
.1758577-02	.9505218+04	-.1700279-03	.9563400+04	.4051937+04	.0000000
-.1442921-05	.9563400+04	-.7979478+04	-.8607161+04	.4136066+04	.0000000
.8682983-02	-.5903552+02	-.4921418+04	-.2938578+04	.4736480+04	.0000000
.2543911-02	.0000000	-.1086869+05	-.9518464+04	.0000000	.0000000
.7003971-03	.0000000	-.4359204+04	-.5228139+04	.2556067+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.5547626-04	-.7054733-05	.1207176-03	.9038562-04	.4087239-04	.0000000
.1023011-02	.3262783+03	-.6185308-04	.1568542+01	.1999275+04	.0000000
.4792908-03	.1568542+01	-.2684809+04	-.8759265+03	.2030664+04	.0000000
-.1142618-02	.7069059+02	-.2976715+04	-.4100707+04	.1767160+04	.0000000
-.1968470-03	.0000000	-.4836025+04	-.4495196+04	.0000000	.0000000
.2911322-03	.0000000	-.1505386+04	.1814215+03	.1354338+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.3588423-04	-.2578723-04	-.6776916-04	.5228143-04	.2079583-04	.0000000
-.3118127-03	.1727473+04	.8255327-04	.1669293+04	-.1224512+04	.0000000
.2818917-03	.1669293+04	-.2138907+04	-.1907889+04	-.1264251+04	.0000000

.8071199-03	.1590058+03	-.1665055+04	-.2458536+04	-.2237306+04	.0000000
.2987227-03	.0000000	-.3223033+04	-.3778708+04	.0000000	.0000000
-.3593798-03	.0000000	-.1184889+04	-.8537509+03	-.6407313+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.4110694-04	-.9427108-04	.1365429-08	.5616892-05	.2437211-04	.0000000
.7707761-08	.5406641+04	-.1403595-08	.5649068+04	.2411712-01	.0000000
.1911129-05	.5649068+04	-.3303641+04	-.4901961+04	.2479770-01	.0000000
.5063559-02	-.2129830-02	-.1307163+04	-.9569928+03	.3831629-01	.0000000
.1451870-02	.0000000	-.3849382+04	-.4743331+04	.0000000	.0000000
.6024523-08	.0000000	-.1794113+04	-.3170104+04	.1355888-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.3588418-04	-.2578537-04	.6776791-04	.5228276-04	.2079582-04	.0000000
.3118021-03	.1727375+04	-.8255262-04	.1669187+04	.1224492+04	.0000000
.2818996-03	.1669187+04	-.2138881+04	-.1907809+04	.1264230+04	.0000000
.8070048-03	-.1590065+03	-.1665069+04	-.2458581+04	.2237288+04	.0000000
.2986917-03	.0000000	-.3223024+04	-.3778687+04	.0000000	.0000000
.3593773-03	.0000000	-.1184876+04	-.8536878+03	.6407173+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.5547714-04	.7053466-05	-.1207221-03	.9028531-04	.4087322-04	.0000000
-.1023041-02	.3263592+03	.6185680-04	.1650635+01	-.1999353+04	.0000000
.4792878-03	.1650635+01	-.2684870+04	-.8759961+03	-.2030743+04	.0000000
-.1142537-02	-.7068738+02	-.2976749+04	-.4100712+04	-.1767263+04	.0000000
-.1968236-03	.0000000	-.4836104+04	-.4495256+04	.0000000	.0000000
-.2411478-03	.0000000	-.1505419+04	.1813760+03	-.1354385+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.3913901+00	.2242500+02	.1000000-01	.1701700-02	.2147697+02	.3000000+00
-.1206091-03	-.1474846-03	-.2384897-03	.2270844-04	.1015534-03	.0000000
-.1758566-02	.9505431+04	.1700272-03	.9563623+04	-.4051916+04	.0000000
-.1454963-05	.9563623+04	-.7979591+04	-.8607339+04	-.4136045+04	.0000000
.8683214-02	.5903626+02	-.4921451+04	-.2938541+04	-.4736461+04	.0000000
.2543975-02	.0000000	-.1086881+05	-.9518569+04	.0000000	.0000000
-.7003946-03	.0000000	-.4359264+04	-.5228266+04	-.2556053+04	.0000000

THETA ANGLE= .00000 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.1975833-03	-.2732899-03	.0000000	-.2510043-03	-.1231197-03	.0000000
.0000000	.1458843+05	.0000000	.1495354+05	.0000000	.0000000
-.3754095-03	-.1495354+05	-.1298046+05	-.1435385+05	.0000000	.0000000
.1884735-01	.0000000	-.2667432+04	.6876132+04	.0000000	.0000000
.4543051-02	.0000000	-.1278768+05	-.5034550+04	.0000000	.0000000
.0000000	.0000000	-.7654669+04	-.1048264+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.1441041-03	-.1500007-03	.2141952-03	-.1059014-03	.9653944-04	.0000000
.1912079-02	.8478337+04	-.1566533-03	.8530948+04	.3647583+04	.0000000
.9138568-05	.8530948+04	-.8891284+04	-.8547978+04	.3724967+04	.0000000
.1014170-01	-.4137310+03	-.3148106+04	.2107094+04	.4356711+04	.0000000
.2519137-02	.0000000	-.9951033+04	-.4844647+04	.0000000	.0000000
.7928998-03	.0000000	-.5205259+04	-.5858776+04	.2285807+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.6058871-04	.9835335-05	.1079147-03	.7794427-04	.4820162-04	.0000000
.1109554-02	.3422822+03	-.5750814-04	.5157068+02	.1791969+04	.0000000
.4719540-03	.5157068+02	-.2888934+04	-.7844136+03	.1821052+04	.0000000
-.1246405-02	-.6665952+02	-.3118666+04	-.3710031+04	.1637408+04	.0000000
-.1485415-03	.0000000	-.5124452+04	-.4067502+04	.0000000	.0000000
.2745607-03	.0000000	-.1632581+04	.2023767+03	.1205163+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.4155412-04	-.2522119-04	-.6157965-04	.2637568-04	.2225431+04	.0000000
-.3429244-03	.1561220+04	.7532345-04	.1508611+04	-.1113337+04	.0000000
.2763631-03	.1508611+04	-.2359277+04	-.1863971+04	-.1149590+04	.0000000
.9831540-03	.3194566+03	-.1406476+04	-.1471335+04	-.2041038+04	.0000000
.3211743-03	.0000000	-.3156955+04	-.2839678+04	.0000000	.0000000
-.4046068-03	.0000000	-.1370169+04	-.9515426+03	-.5814370+03	.0000000

THETA ANGLE= 3.14160 RADIANS

-.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.5255539-04	-.9682335-04	.1235303-08	-.6393420-04	.1806459-04	.0000000
.8429478-08	.4806068+04	-.1283939-08	.5022375+04	.2184888-01	.0000000
.2509143-05	.5022375+04	-.3742768+04	-.4901167+04	.2247112-01	.0000000
.5895091-02	-.4905084-02	-.2044174+03	.1815395+04	.3503202-01	.0000000
.1434636-02	.0000000	-.3179388+04	-.2199104+04	.0000000	.0000000
.6792090-08	.0000000	-.2231009+04	-.3542705+04	.1223144-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.4155393-04	-.2521925-04	.6157853-04	.2637816-04	.2225453-04	.0000000
.3429129-03	.1561133+04	-.7532285-04	.1508517+04	.1113318+04	.0000000
.2763708-03	.1508517+04	-.2359245+04	-.1863890+04	.1149571+04	.0000000
.9830213-03	-.3194559+03	-.1406514+04	-.1471427+04	.2041021+04	.0000000
.3211443-03	.0000000	-.3156963+04	-.2839699+04	.0000000	.0000000
.4046039-03	.0000000	-.1370149+04	-.9514727+03	.5814245+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.6058778-04	.9834037-05	-.1079187+03	.7799290-04	.4820239-04	.0000000
-.1109587-02	.3423541+03	.5751156-04	.5164374+02	-.1792039+04	.0000000
.4719512-03	.5164374+02	-.2889002+04	-.7844831+03	-.1821124+04	.0000000
-.1246310-02	.6667031+02	-.3118684+04	-.3709993+04	-.1637502+04	.0000000
-.1485186-03	.0000000	-.5124522+04	-.4067523+04	.0000000	.0000000
-.2745784-03	.0000000	-.1632621+04	.2023256+03	-.1205205+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.4016003+00	.2301000+02	.1000000-01	.1701700-02	.2200721+02	.3000000+00
-.1441058-03	-.1500045-03	-.2141941-03	-.1059058-03	.9654032-04	.0000000
-.1912067-02	.8478525+04	.1566527-03	.8531145+04	-.3647565+04	.0000000
.9126934-05	.8531145+04	-.8891412+04	-.8548157+04	-.3724948+04	.0000000
.1014197-01	.4137304+03	-.3148094+04	.2107239+04	-.4356695+04	.0000000
-.2519199-02	.0000000	-.9951125+04	-.4844655+04	.0000000	.0000000
-.7928969-03	.0000000	-.5205335+04	-.5858918+04	-.2285795+04	.0000000

THETA ANGLE= .00000 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.2331078-03	-.2787588-03	.0000000	-.4362427-03	.1044498-03	.0000000
.0000000	.1285276+05	.0000000	.1317117+05	.0000000	.0000000
-.3285184-03	.1317117+05	-.1435141+05	-.1436090+05	.0000000	.0000000
.2141040-01	.0000000	.3247002+03	.1428291+05	.0000000	.0000000
-.4344164-02	.0000000	-.1110925+05	.1752291+04	.0000000	.0000000
.0000000	.0000000	-.8973107+04	-.1146611+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.1667221-03	-.1519887-03	.1904039-03	-.2171185-03	.8905964-04	.0000000
.2055516-02	.7492452+04	-.1400165-03	.7538643+04	.3244064+04	.0000000
.3318644-04	.7538643+04	-.9768781+04	-.8516827+04	.3313206+04	.0000000

.1156573-01	-.7106951+03	-.1500569+04	.6509003+04	.3892667+04	.0000000
.2925492-02	.0000000	-.9122056+04	-.7845328+03	.0000000	.0000000
.8767862-03	.0000000	-.6017381+04	-.6414493+04	.2030007+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.6527180-04	.1205112-04	-.9544550-04	.6666246-04	.5431479-04	.0000000
.1190613-02	.3475732+03	-.5178143-04	.9448328+02	.1586873+04	.0000000
.4651259-03	.9448328+02	-.3078324+04	-.7148779+03	.1613021+04	.0000000
-.1324334-02	-.1823776+03	-.3225982+04	-.3346547+04	.1472115+04	.0000000
-.1070334-03	.0000000	-.5369856+04	-.3681735+04	.0000000	.0000000
.3051086-03	.0000000	-.1753027+04	.2109158+03	.1063615+04	.0000000

THETA ANGLE= 2.35620 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.4700391-04	-.2474111-04	-.5542252-04	.3635404-05	.2297864-04	.0000000
-.3717258-03	.1399501+04	.6678556-04	.1353311+04	-.9998686+03	.0000000
.2729856-03	.1353311+04	-.2572169+04	-.1832188+04	-.1032031+04	.0000000
.1168036-02	.4527686+03	-.1159655+04	-.5982127+03	-.1810756+04	.0000000
.3296525-03	.0000000	-.3095926+04	-.2014962+04	.0000000	.0000000
-.4452913-03	.0000000	-.1549424+04	-.1041212+04	-.5258176+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.6380019-04	-.9880181-04	.1106671-08	-.1240464-03	.1099730-04	.0000000
.9100477-08	.4235954+04	-.1140819-08	.4423718+04	.1955363-01	.0000000
.1061465-04	.4423718+04	-.4173815+04	-.4907321+04	.2010672-01	.0000000
.6705709-02	-.7219960-02	.8067853+03	.4231682+04	.3113878-01	.0000000
.1380174-02	.0000000	-.2587010+04	.1215820+02	.0000000	.0000000
.7484019-08	.0000000	-.2654430+04	-.3867079+04	.1098134-01	.0000000

THETA ANGLE= 3.92700 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.4700366-04	-.2473909-04	-.5542153-04	.3638877-05	.2297908-04	.0000000
.3717135-03	.1399425+04	-.6678502-04	.1353228+04	.9998521+03	.0000000
.2729930-03	.1353228+04	-.2572131+04	-.1832106+04	.1032014+04	.0000000
.1167887-02	-.4527667+03	-.1159713+04	-.5983457+03	.1810741+04	.0000000
.3296243-03	.0000000	-.3095949+04	-.2015020+04	.0000000	.0000000
.4452882-03	.0000000	-.1549397+04	-.1041135+04	.5258066+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.6527305-04	.1204980-04	-.9544911-04	.6666017-04	.5431547-04	.0000000
-.1190649-02	.3476366+03	.5178447-04	.9454761+02	-.1586936+04	.0000000
.4651234-03	.9454761+02	-.3078399+04	-.7149470+03	-.1613085+04	.0000000
-.1324226-02	.1823947+03	-.3225985+04	-.3346474+04	-.1472199+04	.0000000
-.1070116-03	.0000000	-.5369918+04	-.3681722+04	.0000000	.0000000
-.3051281-03	.0000000	-.1753073+04	.2108599+03	-.1063653+04	.0000000

THETA ANGLE= 5.49780 RADIANS

.4118105+00	.2359500+02	.1000000-01	.1701700-02	.2253515+02	.3000000+00
-.1667242-03	-.1519926-03	-.1904029-03	-.2171252-03	.8906017-04	.0000000
-.2055504-02	.7492617+04	.1400160-03	.7538817+04	-.3244048+04	.0000000
.3317552-04	.7538817+04	-.9768925+04	-.8517007+04	-.3313189+04	.0000000
.1156603-01	.7106932+03	-.1500516+04	.6509240+04	-.3892652+04	.0000000
.2425551-02	.0000000	-.9122122+04	-.7844568+03	.0000000	.0000000
-.8767830-03	.0000000	-.6017474+04	-.6414648+04	-.2029996+04	.0000000

THETA ANGLE= .00000 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.2663832-03	-.2832057-03	.0000000	-.5941107-03	.8362201-04	.0000000
.0000000	.1119086+05	.0000000	.1145991+05	.0000000	.0000000
-.2589766-03	.1145991+05	-.1563324+05	-.1439357+05	.0000000	.0000000
.2382946-01	.0000000	.3055246+04	.2065616+05	.0000000	.0000000
.4046759-02	.0000000	-.9601343+04	.7569563+04	.0000000	.0000000
.0000000	.0000000	-.1020451+05	-.1231940+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.1078377-03	-.1536581-03	.1670580-03	-.3121242-03	.7972057-04	.0000000
.2189232-02	.6544379+04	-.1210074-03	.6583647+04	.2842370+04	.0000000
.7039522-04	.6583647+04	-.1058762+05	-.8510635+04	.2902182+04	.0000000
.1291815-01	-.9559748+03	.1500629+02	.1030541+05	.3367438+04	.0000000
.2272628-02	.0000000	-.8368528+04	.2699889+04	.0000000	.0000000
.9504408-03	.0000000	-.6776241+04	-.6901363+04	.1785707+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.6954511-04	.1375794-04	.8328551-04	.5656149-04	.5922818-04	.0000000
.1266348-02	.3450056+03	-.4503405+04	.1314939+03	.1384381+04	.0000000
.4587431-03	.1314939+03	-.3253289+04	-.6655656+03	.1407128+04	.0000000
-.1380136-02	-.2785978+03	-.3300879+04	-.3015012+04	.1280651+04	.0000000
-.7167507-04	.0000000	-.5574485+04	-.3340913+04	.0000000	.0000000
.3320871-03	.0000000	-.1866859+04	.2090509+03	.9284837+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701708-02	.2306074+02	.3000000+00
-.5213237-04	-.2436622-04	-.4927360-04	-.1611274-04	.2307564-04	.0000000
-.3983361-03	.1242437+04	.5731882-04	.1203170+04	-.8845435+03	.0000000
.2717549-03	.1203170+04	-.2773470+04	-.1811432+04	-.9121866+03	.0000000
.1354226-02	.5619708+03	-.9261375+03	.1662663+03	-.1556302+04	.0000000
-.3259270-03	.0000000	-.3038162+04	-.1298628+04	.0000000	.0000000
-.4807922-03	.0000000	-.1719385+04	-.1123202+04	-.4726229+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.7446623-04	-.1003576-03	-.9791023-09	-.1754835-03	.3514292-05	.0000000
.9722995-08	.3692721+04	-.9809158-09	.3850698+04	.1723898-01	.0000000
.2579444-04	.3850698+04	-.4582320+04	-.4919386+04	.1771518-01	.0000000
.7475458-02	-.9120543-02	.1724211+04	.6317107+04	.2681000-01	.0000000
-.1293685-02	.0000000	-.2063074+04	.1914732+04	.0000000	.0000000
.8088771-08	.0000000	-.3052999+04	-.4147777+04	.9786490-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.5213189-04	-.2436415-04	-.4927273-04	-.1610843-04	.2307629-04	.0000000
.3983229-03	.1242372+04	-.5731836-04	.1203099+04	.8845292+03	.0000000
.2717619-03	.1203099+04	-.2773427+04	-.1811350+04	.9121719+03	.0000000
.1354060-02	-.5619679+03	-.9262142+03	.1660984+03	.1556289+04	.0000000
-.3259011-03	.0000000	-.3038198+04	-.1298718+04	.0000000	.0000000
.4807887-03	.0000000	-.1719352+04	-.1123120+04	.4726132+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.6954652-04	.1375659-04	-.8328869-04	.5655842-04	.5922877-04	.0000000
-.1266386-02	.3450608+03	.4503667-04	.1315499+03	-.1384436+04	.0000000
.4587410-03	.1315499+03	-.3253370+04	-.6656352+03	-.1407184+04	.0000000
-.1380016-02	.2786202+03	-.3300869+04	-.3014906+04	-.1280724+04	.0000000
-.7165481-04	.0000000	-.5574540+04	-.3340871+04	.0000000	.0000000
-.3321082-03	.0000000	-.1866911+04	.2089908+03	-.9285170+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4220207+00	.2418000+02	.1000000-01	.1701700-02	.2306074+02	.3000000+00
-.1878402-03	-.1536421-03	-.1670571-03	-.3121328-03	.7972076-04	.0000000
-.2189219-02	.6544522+04	.1210069-03	.6583797+04	-.2842355+04	.0000000
.7038529-04	.6583797+04	-.1058777+05	-.8510817+04	-.2902167+04	.0000000

.1291848-01	.9559719+03	.1509679+02	.1030572+05	-.3367425+04	.0000000
.2272682-02	.0000000	-.8368571+04	.2700037+04	.0000000	.0000000
-.9504379-03	.0000000	-.6776348+04	-.6901530+04	-.1785697+04	.0000000

THETA ANGLE= .00000 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.2964911-03	-.2869644-03	.0000000	-.7264980-03	.6150286-04	.0000000
.0000000	.9595035+04	.0000000	.9813706+04	.0000000	.0000000
-.1680420-03	.9813706+04	-.1679010+05	-.1444762+05	.0000000	.0000000
.2605209-01	.0000000	.5518094+04	.2605827+05	.0000000	.0000000
.3666014-02	.0000000	-.8241733+04	.1247857+05	.0000000	.0000000
.0000000	.0000000	-.1132074+05	-.1305257+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.2069372-03	-.1581740-03	.1441677-03	-.3919647-03	.6903887-04	.0000000
.2313546-02	.5630998+04	-.1003684-03	.5663107+04	.2444241+04	.0000000
-.1200018-03	.5663107+04	-.1132756+05	-.8526150+04	.2493981+04	.0000000
.1416740-01	-.1154807+04	.1393847+04	.1353046+05	.2800368+04	.0000000
.2069557-02	.0000000	-.7679113+04	.5642924+04	.0000000	.0000000
.1012716-02	.0000000	-.7465856+04	-.7324286+04	.1551176+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.7342564-04	.1500375-04	.7143564-04	-.4769617-04	.6298585-04	.0000000
.1336908-02	.3369581+03	-.3757000-04	.1636965+03	.1185155+04	.0000000
-.4527356-03	.1636965+03	-.3414158+04	-.6348210+03	.1204177+04	.0000000
-.1417151-02	-.3571975+03	-.3345795+04	-.2717972+04	.1070932+04	.0000000
-.4176931-04	.0000000	-.5740807+04	-.3046095+04	.0000000	.0000000
.3549982-03	.0000000	-.1974137+04	.1983738+03	.7990205+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.5685572-04	-.2411006-04	-.4314170-04	-.3303454-04	.2264325-04	.0000000
-.4228614-03	.1090058+04	.4723573-04	.1057950+04	-.7681656+03	.0000000
.2725856-03	.1057950+04	-.2989750+04	-.1800603+04	-.7910044+03	.0000000
.1535171-02	.6496453+03	-.7072818+03	.8273566+03	-.1285823+04	.0000000
-.3116697-03	.0000000	-.2982237+04	-.6849276+03	.0000000	.0000000
-.5106661-03	.0000000	-.1877315+04	-.1197868+04	-.4211820+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.8424296-04	-.1016101-03	.8527295-09	-.2188897-03	-.4109985-05	.0000000
.1029905-07	.3173125+04	-.8097566-09	.3300976+04	.1491880-01	.0000000
.4774895-04	.3300976+04	-.4956173+04	-.4936188+04	.1531293-01	.0000000
.8187252-02	-.1065056-01	.2546577+04	.8093192+04	.2218972-01	.0000000
.1179964-02	.0000000	-.1599369+04	.3529542+04	.0000000	.0000000
.8598307-08	.0000000	-.3417305+04	-.4388432+04	.8634727-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.5685510-04	-.2410795-04	.4314096-04	-.3302953-04	.2264409-04	.0000000
.4228475-03	.1090002+04	-.4723534-04	.1057898+04	.7681533+03	.0000000
.2725920-03	.1057890+04	-.2959702+04	-.1800520+04	.7909919+03	.0000000
.1534991-02	-.6496416+03	-.7073747+03	.8271591+03	.1285812+04	.0000000
.3116464-03	.0000000	-.2982284+04	-.6850438+03	.0000000	.0000000
.5106624-03	.0000000	-.1877277+04	-.1197782+04	.4211736+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.7342720-04	.1500239+04	-.7143840-04	.4769243-04	-.6298634-04	.0000000
-.1336948-02	.3370053+03	.3757218-04	.1637444+03	-.1185202+04	.0000000
.4527348-03	.1637444+03	-.3414245+04	-.6348910+03	-.1204225+04	.0000000
-.1417019-02	.3572241+03	-.3345773+04	-.2717839+04	-.1070992+04	.0000000
-.4175103-04	.0000000	-.5740855+04	-.3046029+04	.0000000	.0000000
-.3550207-03	.0000000	-.1974195+04	.1983101+03	-.7990496+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4322309+00	.2476500+02	.1000000-01	.1701700-02	.2358393+02	.3000000+00
-.2069400-03	-.1551781-03	-.1441670-03	-.3919750-03	.6903871-04	.0000000
-.2313532-02	.5631120+04	.1003680-03	.5663234+04	-.2444229+04	.0000000
-.1199932-03	.5663234+04	-.1132773+05	-.8526333+04	-.2493969+04	.0000000
.1416777-01	.1154804+04	.1393971+04	.1353084+05	-.2800357+04	.0000000
.2069607-02	.0000000	-.7679135+04	.5643132+04	.0000000	.0000000
-.1012713-02	.0000000	-.7465977+04	-.7324462+04	-.1551168+04	.0000000

THETA ANGLE= .00000 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.3226865-03	-.2902921-03	.0000000	-.8350336-03	.3880643-04	.0000000
.0000000	.8058063+04	.0000000	.8226641+04	.0000000	.0000000
-.5763348-04	.8226641+04	-.1779264+05	-.1451869+05	.0000000	.0000000
.2803428-01	.0000000	.7709118+04	.3054350+05	.0000000	.0000000
.3216096-02	.0000000	-.7011484+04	.1653317+05	.0000000	.0000000
.0000000	.0000000	-.1229890+05	-.1367364+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.2236059-03	-.1566608-03	.1217929-03	-.4575651-03	.5745430-04	.0000000
.2428770-02	.4749248+04	-.7872196-04	.4774173+04	.2051933+04	.0000000
.1808690-03	.4774173+04	-.1197215+05	-.8560053+04	.2091197+04	.0000000
.1528697-01	-.1311734+04	.2632269+04	.1621461+05	.2207737+04	.0000000
-.1824726-02	.0000000	-.7044385+04	.8075450+04	.0000000	.0000000
.1062857-02	.0000000	-.8073247+04	-.7687169+04	.1325607+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.7693039-04	.1583120-04	-.5991518-04	-.4007015-04	.6565065-04	.0000000
.1402493-02	.3254163+03	-.2964600-04	.1920872+03	.9900410+03	.0000000
-.4470274-03	-.1920872+03	-.3561342+04	-.6210548+03	.1005133+04	.0000000
-.1438311-02	-.4198289+03	-.3363241+04	-.2456243+04	.8496647+03	.0000000
-.1660256-04	.0000000	-.5871427+04	-.2796800+04	.0000000	.0000000
.3735049-03	.0000000	-.2074928+04	.1801610+03	.6748247+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.6110624-04	-.2398101-04	-.3705940-04	-.4728735-04	.2177087-04	.0000000
-.4454042-03	.9423174+03	.3679567-04	.9173936+03	-.6517923+03	.0000000
.2753237-03	.9173936+03	-.3128212+04	-.1798619+04	-.6696629+03	.0000000
.1705255-02	.7179966+03	-.5042796+03	.1390093+04	-.1006116+04	.0000000
.2884596-03	.0000000	-.2927061+04	-.1683359+03	.0000000	.0000000
-.5346340-03	.0000000	-.2020972+04	-.1265487+04	-.3712533+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.9287635-04	-.1026529-03	.7280986-09	-.2548082-03	-.1165693-04	.0000000
.1083061-07	.2674207+04	-.6319413-09	.2772287+04	.1261122-01	.0000000
.7595697-04	.2772287+04	-.5285361+04	-.4956497+04	.1292025-01	.0000000
.8826668-02	-.1184750-01	.3273284+04	.9578265+04	.1739839-01	.0000000
.1043468-02	.0000000	-.1188657+04	.4874577+04	.0000000	.0000000
.9007489-08	.0000000	-.3739648+04	-.4591934+04	.7521279-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.6110551-04	-.2397887-04	.3705877-04	-.4728177-04	.2177190-04	.0000000
.4453896-03	.9422713+03	-.3679536-04	.9173440+03	.6517820+03	.0000000
.2753294-03	.9173440+03	-.3128160+04	-.1798535+04	.6696525+03	.0000000

.1705063-02	-.7179922+03	-.5043866+03	.1389871+04	.1006107+04	.0000000
.2884394-03	.0000000	-.2927118+04	-.1684737+03	.0000000	.0000000
.5346302-03	.0000000	-.2020929+04	-.1265397+04	.3712463+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.7693208-04	.1582982-04	-.5991751-04	.4006589-04	.6565102-04	.0000000
-.1402486-02	.3254558+03	.2964770-04	.1921273+03	-.9900807+03	.0000000
.4470265-03	.1921273+03	-.3561434+04	-.6211249+03	-.1005173+04	.0000000
-.1438170-02	.4198587+03	-.3363208+04	-.2456089+04	-.8497120+03	.0000000
-.1658658-04	.0000000	-.5871470+04	-.2796714+04	.0000000	.0000000
-.3735284-03	.0000000	-.2074991+04	.1800943+03	-.6748497+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4424410+00	.2535000+02	.1000000-01	.1701700-02	.2410466+02	.3000000+00
-.2236090-03	-.1566649-03	-.1217923-03	-.4575767-03	.5745380-04	.0000000
-.2428755-02	.4749350+04	.7872166-04	.4774279+04	-.2051923+04	.0000000
-.1808569-03	.4774279+04	-.1197233+05	-.8560236+04	-.2091136+04	.0000000
.1528736-01	.1311729+04	.2632422+04	.1621505+05	-.2207729+04	.0000000
.1824769-02	.0000000	-.7044390+04	.8075708+04	.0000000	.0000000
-.1062853-02	.0000000	-.8073379+04	-.7687353+04	-.1325600+04	.0000000

THETA ANGLE= .00000 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.3443804-03	-.2933813-03	.0000000	-.9211186-03	.1612123-04	.0000000
.0000000	.6573153+04	.0000000	.6692910+04	.0000000	.0000000
.6979289-04	.6692910+04	-.1861742+05	-.1460236+05	.0000000	.0000000
.2973995-01	.0000000	.9625610+04	.3415892+05	.0000000	.0000000
.2710303-02	.0000000	-.5894623+04	.1978047+05	.0000000	.0000000
.0000000	.0000000	-.1312084+05	-.1418896+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.2375186-03	-.1582076-03	.1000278-03	-.5097416-03	.4534162-04	.0000000
.2535226-02	.3896143+04	-.5659263-04	.3914022+04	.1668024+04	.0000000
-.2515320-03	.3914022+04	-.1250834+05	-.8609052+04	.1696502+04	.0000000
.1625503-01	-.1430695+04	.3727406+04	.1838493+05	.1603327+04	.0000000
.1546081-02	.0000000	-.6456835+04	.1002516+05	.0000000	.0000000
.1100436-02	.0000000	-.8588150+04	-.7993083+04	.1108865+04	.0000000

THETA ANGLE= 1.57080 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.8007803-04	.1627929-04	.4875604-04	.3364788-04	.6729763-04	.0000000
.1463105-02	.3120394+03	-.2147949-04	.2175656+03	.7999982+03	.0000000
.4415380-03	.2175656+03	-.3695377+04	-.6227267+03	.8110560+03	.0000000
-.1446140-02	-.4679464+03	-.3355707+04	-.2229286+04	.6225538+03	.0000000
.4528934-05	.0000000	-.5969031+04	-.2591340+04	.0000000	.0000000
.3874059-03	.0000000	-.2169358+04	.1554507+03	.5557518+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.6483116-04	-.2398286-04	-.3107574-04	-.5901954-04	.2053989-04	.0000000
-.4660705-03	.7991085+03	.2621567-04	.7812311+03	-.5366460+03	.0000000
.2797591-03	.7812311+03	-.3276696+04	-.1804426+04	-.5494860+03	.0000000
.1859746-02	.7689085+03	-.3181777+03	.1859264+04	-.7228927+03	.0000000
.2577879-03	.0000000	-.2871872+04	.2564095+03	.0000000	.0000000
-.5525534-03	.0000000	-.2148567+04	-.1326258+04	-.3229076+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.1001624-03	-.1035569-03	.6060051-09	-.2836958-03	-.1895293-04	.0000000
.1131970-07	.2193249+04	-.4513273-09	.2262439+04	.1033715-01	.0000000
.1097156-03	.2262439+04	-.5561763+04	-.4979089+04	.1055984-01	.0000000
.9381762-02	-.1274351-01	.3904196+04	.1078789+05	.1253752-01	.0000000
.8883662-03	.0000000	-.8247555+03	.5965249+04	.0000000	.0000000
.9313607-08	.0000000	-.4013844+04	-.4760564+04	.6446745-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.6483034-04	-.2398069-04	.3107523-04	-.5901350-04	.2054108-04	.0000000
.4660553-03	.7990715+03	-.2621545-04	.7811915+03	.5366377+03	.0000000
.2797690-03	.7811915+03	-.3276590+04	-.1804342+04	.5494776+03	.0000000
.1859543-02	-.7689036+03	-.3182966+03	.1859022+04	.7228862+03	.0000000
.2577710-03	.0000000	-.2871936+04	.2562540+03	.0000000	.0000000
.5525494-03	.0000000	-.2148520+04	-.1326165+04	.3229018+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.8007983-04	.1627789-04	-.4875797-04	.3364319-04	.6729789-04	.0000000
-.1463150-02	.3120717+03	.2148071-04	.2175981+03	-.8000307+03	.0000000
.4415377-03	.2175981+03	-.3695473+04	-.6227975+03	-.8110891+03	.0000000
-.1445991-02	.4679788+03	-.3355665+04	-.2229114+04	-.6225881+03	.0000000
.4542337-05	.0000000	-.5969068+04	-.2591238+04	.0000000	.0000000
-.3874302-03	.0000000	-.2169425+04	.1553813+03	-.5557729+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4526512+00	.2593501+02	.1000000-01	.1701700-02	.2462288+02	.3000000+00
-.2375220-03	-.1582118-03	-.1000272-03	-.5097543-03	-.4534079-04	.0000000
-.2535211-02	.3896226+04	.5659241-04	.3914107+04	-.1668015+04	.0000000
.2515266-03	.3914107+04	-.1250853+05	-.8609236+04	-.1696494+04	.0000000
.1625545-01	.1430690+04	.3727585+04	.1838541+05	-.1603321+04	.0000000
.1546117-02	.0000000	-.6456823+04	.1002546+05	.0000000	.0000000
-.1100432-02	.0000000	-.8588291+04	-.7993274+04	-.1108860+04	.0000000

THETA ANGLE= .00000 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.3611243-03	-.2963688-03	.0000000	-.9859547-03	-.6067878-05	.0000000
.0000000	.5133896+04	.0000000	.5206865+04	.0000000	.0000000
.2113567-03	.5206865+04	-.1924698+05	-.1469440+05	.0000000	.0000000
.3114096-01	.0000000	.1126584+05	.3694519+05	.0000000	.0000000
.2161185-02	.0000000	-.4878979+04	.2226151+05	.0000000	.0000000
.0000000	.0000000	-.1377262+05	-.1460345+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.2484318-03	-.1598733-03	.7898880-04	-.5492128-03	.3302047-04	.0000000
.2633252-02	.3068770+04	-.3442507-04	.3079866+04	.1295265+04	.0000000
.3303136-03	.3079866+04	-.1292628+05	-.8669955+04	.1313007+04	.0000000
.1705424-01	-.1515112+04	.4676997+04	.2006538+05	.9988652+03	.0000000
.1241126-02	.0000000	-.5910857+04	.1151674+05	.0000000	.0000000
.1125303-02	.0000000	-.9002771+04	-.8244391+04	.9012974+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.8288975-04	-.1638455-04	.3799830-04	.2836379-04	.6800926-04	.0000000
.1519053-02	.2982169+03	-.1325533-04	.2409395+03	.6160408+03	.0000000
.4361849-03	.2409395+03	-.3816937+04	-.6383387+03	.6230473+03	.0000000
-.1442765-02	-.5028307+03	-.3325595+04	-.2035498+04	.3944633+03	.0000000
.2229957-04	.0000000	-.6036330+04	-.2427081+04	.0000000	.0000000
.3966156-03	.0000000	-.2257645+04	.1250987+03	.4418405+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.6799151-04	-.2411527-04	-.2525065-04	-.6837016-04	.1902416-04	.0000000
-.4849744-03	.6602753+03	.1567898-04	.6491801+03	-.4240448+03	.0000000
.2856366-03	.6491801+03	-.3403392+04	-.1817009+04	-.4318778+03	.0000000

.1994748-02	.8039914+03	-.1498984+03	.2239389+04	-.4410034+03	.0000000
.2210630-03	.0000000	-.2816216+04	.5942883+03	.0000000	.0000000
-.5643966-03	.0000000	-.2258736+04	-.1380316+04	-.2764356+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.1059421-03	-.1043761-03	.4874769-09	-.3059348-03	-.2586074-04	.0000000
.1176898-07	.1727743+04	-.2711749-09	.1769329+04	.8119098-02	.0000000
.1481769-03	.1769329+04	-.5778982+04	-.5002796+04	.8255746-02	.0000000
.9842927-02	-.1336621-01	.4439475+04	.1173520+05	.7693282-02	.0000000
.7185859-03	.0000000	-.5025382+03	.6814652+04	.0000000	.0000000
.9515993-08	.0000000	-.4235065+04	-.4896100+04	.5415524-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.6799062-04	-.2411308-04	.2525025-04	-.6836379-04	.1902549-04	.0000000
.4849587-03	.6602469+03	-.1567885-04	.6491502+03	.4240384+03	.0000000
.2856407+03	.6491502+03	-.3903334+04	-.1816929+04	.4318714+03	.0000000
.1994537-02	-.8039862+03	-.1500271+03	.2239133+04	.4409993+03	.0000000
.2210497-03	.0000000	-.2816288+04	.5941199+03	.0000000	.0000000
.5643925-03	.0000000	-.2258686+04	-.1380221+04	.2764310+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.8289163-04	.1638313-04	-.3799984-04	.2835879-04	.6800940-04	.0000000
-.1519099-02	.2982419+03	.1325606-04	.2409648+03	-.6160661+03	.0000000
-.4361853-03	.2409648+03	-.3817036+04	-.6384100+03	-.6230730+03	.0000000
-.1442608-02	.5028648+03	-.3325545+04	-.2035313+04	-.3944845+03	.0000000
-.2231018-04	.0000000	-.6036362+04	-.2426968+04	.0000000	.0000000
-.3966405-03	.0000000	-.2257715+04	.1250274+03	-.4418578+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4628614+00	.2652001+02	.1000000-01	.1701700-02	.2513853+02	.3000000+00
-.2484353-03	-.1598775-03	-.7898841-04	-.5492262-03	.3301934-04	.0000000
-.2633237-02	.3068834+04	.3442493-04	.3079931+04	-.1295259+04	.0000000
.3303104-03	.3079931+04	-.1292648+05	-.8670140+04	-.1313001+04	.0000000
.1705468-01	.1515107+04	.4677197+04	.2006590+05	-.9988611+03	.0000000
.1241155-02	.0000000	-.5910831+04	.1151709+05	.0000000	.0000000
-.1125299-02	.0000000	-.9002919+04	-.8244587+04	-.9012927+03	.0000000

THETA ANGLE= .00000 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.3725982-03	-.2993438-03	.0000000	-.1030567-02	-.2736187+04	.0000000
.0000000	.3734245+04	.0000000	.3763037+04	.0000000	.0000000
.3638570-03	.3763037+04	-.1966673+05	-.1479081+05	.0000000	.0000000
.3221423-01	.0000000	.1262869+05	.3893721+05	.0000000	.0000000
.1580636-02	.0000000	-.3955389+04	.2401174+05	.0000000	.0000000
.0000000	.0000000	-.1429420+05	-.1492086+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.2561766-03	-.1616904-03	-.5880532-04	-.5766086-03	.2076369-04	.0000000
.2723213-02	.2264301+04	-.1259863-04	.2268975+04	.9364673+03	.0000000
.4153362-03	.2268975+04	-.1321903+05	-.8739727+04	.9436502+03	.0000000
.1767147-01	-.1567956+04	.5479200+04	.2127713+05	.4043953+03	.0000000
.9169814-03	.0000000	-.5402742+04	.1257221+05	.0000000	.0000000
.1137548-02	.0000000	-.9311578+04	-.8442852+04	.7035700+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.8538970-04	.1618178-04	.2768648-04	.2412950-04	.6787185-04	.0000000
.1570455-02	.2851136+03	-.5131235-05	.2629318+03	.4391944+03	.0000000
-.4308861-03	.2629318+03	-.3926838+04	-.6664281+03	.4422060+03	.0000000
-.1429933-02	-.5256087+03	-.3275175+04	-.1872448+04	.1695574+03	.0000000
.3733915-04	.0000000	-.6076030+04	-.2300659+04	.0000000	.0000000
.4011465-03	.0000000	-.2340111+04	.8981972+02	.3332530+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.7056107-04	-.2437427-04	-.1965039-04	-.7546893-04	.1729057-04	.0000000
-.5022417-03	.5256238+03	.5341885-05	.5209500+03	-.3153474+03	.0000000
.2926668-03	.5209500+03	-.3507301+04	-.1835396+04	-.3182710+03	.0000000
.2107154-02	.8246217+03	-.2595031+00	.2534712+04	-.1646024+03	.0000000
.1796163-03	.0000000	-.2759944+04	.8499812+03	.0000000	.0000000
-.5702332-03	.0000000	-.2350508+04	-.1427736+04	-.2322752+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.1100970-03	-.1051477-03	.3736172-09	-.3218428-03	-.3227258-04	.0000000
.1217931-07	.1275365+04	-.9426522-10	.1290937+04	.5980176-02	.0000000
-.1903782-03	.1290937+04	-.5932208+04	-.5026531+04	.6032388-02	.0000000
.1020276-01	-.1373929-01	.4879458+04	.1243120+05	.2939535-02	.0000000
.5378553-03	.0000000	-.2179564+03	.7433849+04	.0000000	.0000000
.9615710-08	.0000000	-.4399709+04	-.4999899+04	.4434552-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.7056014-04	-.2437207-04	-.1965010-04	-.7546233-04	.1729203-04	.0000000
.5022254-03	.5256040+03	-.5341832-05	.5209296+03	.3153428+03	.0000000
.2926700-03	.5209296+03	-.3507242+04	-.1835311+04	.3182664+03	.0000000
.2106936-02	-.8246162+03	-.3959428+00	.2534445+04	.1646007+03	.0000000
.1796067-03	.0000000	-.2760021+04	.8498026+03	.0000000	.0000000
.5702290-03	.0000000	-.2350456+04	-.1427640+04	.2322717+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.8539163-04	.1618036-04	-.2768764-04	.2412429-04	.6787189-04	.0000000
-.1570502-02	.2851317+03	.5131499-05	.2629500+03	-.4392128+03	.0000000
.4308874-03	.2629500+03	-.3926939+04	-.6664999+03	-.4422246+03	.0000000
-.1429772-02	.5256439+03	-.3275118+04	-.1872253+04	-.1695657+03	.0000000
.3734682-04	.0000000	-.6076058+04	-.2300537+04	.0000000	.0000000
-.4011716-03	.0000000	-.2340184+04	.8974681+02	-.3332667+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4730716+00	.2710501+02	.1000000-01	.1701700-02	.2565156+02	.3000000+00
-.2561803-03	-.1616946-03	-.5880504-04	-.5766226-03	.2076228-04	.0000000
-.2723196-02	.2264346+04	.1259857-04	.2269021+04	-.9364628+03	.0000000
.4153348-03	.2269021+04	-.1321923+05	-.8739913+04	-.9436456+03	.0000000
.1767192-01	.1567950+04	.5479417+04	.2127767+05	-.4043935+03	.0000000
.9170018-03	.0000000	-.5402703+04	-.1257256+05	.0000000	.0000000
-.1137544-02	.0000000	-.9311731+04	-.8443051+04	-.7035665+03	.0000000

THETA ANGLE= .00000 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.3786004-03	-.3023538-03	.0000000	-.1055825-02	-.4743293-04	.0000000
.0000000	.2368484+04	.0000000	.2356149+04	.0000000	.0000000
.5238677-03	.2356149+04	-.1986999+05	-.1488789+05	.0000000	.0000000
.3294640-01	.0000000	.1371339+05	.4016471+05	.0000000	.0000000
.9800824-03	.0000000	-.3118102+04	.2506151+05	.0000000	.0000000
.0000000	.0000000	-.1452909+05	-.1514391+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.2606533-03	-.1636682-03	.3961150-04	-.5924792-03	.8804300-05	.0000000
.2805498-02	.1480001+04	.8560759-05	.1478687+04	.5944012+03	.0000000
.5046003-03	.1478687+04	-.1338241+05	-.8815538+04	.5913565+03	.0000000

.1809760-01	-.1591802+04	.6132446+04	.2203869+05	-.1714221+03	.0000000
.5804255-03	.0000000	-.4930657+04	.1321082+05	.0000000	.0000000
.1137459-02	.0000000	-.9511126+04	-.8589708+04	.5165457+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.8760497-04	.1570451+04	.1786664-04	.2083934-04	.6697310-04	.0000000
.1617488-02	.2737093+03	.2757623-05	.2841876+03	.2704598+03	.0000000
.4255635-03	.2841876+03	-.4026036+04	-.7055678+03	.2695968+03	.0000000
-.1409049-02	-.5372717+03	-.3206556+04	-.1737055+04	-.4858516+02	.0000000
.5022149-04	.0000000	-.6090798+04	-.2208140+04	.0000000	.0000000
.4010952-03	.0000000	-.2417187+04	.5021597+02	.2302270+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.7252543-04	-.2475267-04	-.1434403-04	-.8043623-04	.1539964-04	.0000000
-.5180117-03	.3949320+03	-.4660829-05	.3962451+03	-.2119099+03	.0000000
.3005353-03	.3962451+03	-.3587699+04	-.1858667+04	-.2100858+03	.0000000
.2194605-02	.8319743+03	.1300080+03	.2749192+04	.1027111+03	.0000000
.1347071-03	.0000000	-.2703194+04	.1027861+04	.0000000	.0000000
-.5702165-03	.0000000	-.2423273+04	-.1468543+04	-.1909524+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.1125463-03	-.1058956-03	.2655829-09	-.3316806-03	-.3810459-04	.0000000
.1255479-07	.8339547+03	.7700584-10	.8253335+03	.3943399-02	.0000000
.2352773-03	.8253335+03	-.6018111+04	-.5049318+04	.3913917-02	.0000000
.1045597-01	-.1388306-01	.5224547+04	.1288500+05	-.1659841-02	.0000000
.3497362-03	.0000000	.3195414+02	.7832034+04	.0000000	.0000000
.9615308-08	.0000000	-.4505297+04	-.5072970+04	.3512300-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.7252460-04	-.2475046-04	-.1434384-04	-.8042950-04	.1540120-04	.0000000
.5179949-03	.3949205+03	.4660800-05	.3962339+03	.2119071+03	.0000000
.3005375-03	.3962339+03	-.3587640+04	-.1858582+04	-.2100827+03	.0000000
.2194383-02	-.8319687+03	.1298659+03	.2748919+04	-.1027105+03	.0000000
.1347013-03	.0000000	-.2703277+04	.1027677+04	.0000000	.0000000
.5702124-03	.0000000	-.2423220+04	-.1468446+04	.1909500+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.8760693-04	.1570306-04	-.1786743-04	.2083402-04	.6697303-04	.0000000
-.1617536-02	.2737206+03	-.2757818-05	.2841989+03	-.2704717+03	.0000000
.4255656-03	.2841989+03	-.4026138+04	-.7056401+03	-.2696086+03	.0000000
-.1408883-02	.5373074+03	-.3206494+04	-.1736859+04	.4858919+02	.0000000
.5022612-04	.0000000	-.6090819+04	-.2208014+04	.0000000	.0000000
-.4011203-03	.0000000	-.2417260+04	.5014189+02	-.2302374+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4832818+00	.2769001+02	.1000000-01	.1701700-02	.2616191+02	.3000000+00
-.2606570-03	-.1636729-03	-.3961132-04	-.5924935-05	.8802639-05	.0000000
-.2805481-02	.1480028+04	-.8560730-05	.1478715+04	-.5943984+03	.0000000
.5046011-03	.1478715+04	-.1338261+05	-.8815717+04	-.5913537+03	.0000000
.1809805-01	.1591797+04	.6132677+04	.2203925+05	.1714216+03	.0000000
.5804378-03	.0000000	-.4930606+04	.1321119+05	.0000000	.0000000
-.1137454-02	.0000000	-.9511282+04	-.8589918+04	-.5165433+03	.0000000

THETA ANGLE= .00000 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.3790391-03	-.3054093-03	.0000000	-.1062456-02	-.6601250-04	.0000000
.0000000	.1031226+04	.0000000	.9811419+03	.0000000	.0000000
.6878280-03	.9811414+03	-.1985232+05	-.1498233+05	.0000000	.0000000
.3332854-01	.0000000	.1451927+05	.4065271+05	.0000000	.0000000
.3703755-03	.0000000	-.2364683+04	.2543650+05	.0000000	.0000000
.0000000	.0000000	-.1462410+05	-.1527447+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.2618260-03	-.1657958-03	.2154022-04	-.5973017-03	-.2658648-05	.0000000
.2880527-02	.7132371+03	.2877073-04	.7064265+03	.2717254+03	.0000000
.5960346-03	.7064265+03	-.1341480+05	-.8894759+04	.2589179+03	.0000000
.1832733-01	-.1588887+04	.6635325+04	.2236620+05	-.7210634+03	.0000000
.2379432-03	.0000000	-.4494628+04	.1344952+05	.0000000	.0000000
.1125500-02	.0000000	-.9599908+04	-.8685761+04	.3411795+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.8956536-04	.1498512-04	.8583965-05	.1837465-04	.6540026-04	.0000000
.1660340-02	.2648299+03	.1029485-04	.3052822+03	.1107848+03	.0000000
.4201451-03	.3052822+03	-.4115600+04	-.7543677+03	.1062222+03	.0000000
-.1381201-02	-.5386912+03	-.3121678+04	-.1625733+04	-.2568750+03	.0000000
.6145572-04	.0000000	-.6083227+04	-.2145158+04	.0000000	.0000000
.3966304-03	.0000000	-.2489401+04	.6797501+01	.1330367+03	.0000000

THETA ANGLE= 2.35620 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.7388116-04	-.2524043-04	-.9400519-05	-.8338331-04	.1340601-04	.0000000
-.5324383-03	.2679577+03	-.1421142-04	.2747681+03	-.1150503+03	.0000000
.3089126-03	.2747681+03	-.3644355+04	-.1885955+04	-.1086954+03	.0000000
.2255450-02	.8270511+03	.2402437+03	.2886505+04	.3577823+03	.0000000
.8752830-04	.0000000	-.2646386+04	.1131990+04	.0000000	.0000000
-.5645723-03	.0000000	-.2476760+04	-.1502715+04	-.1530350+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.1132438-03	-.1066321-03	.1645265-09	-.3356593-03	-.4329244-04	.0000000
.1289775-07	.4015019+03	.2405505-09	.3706815+03	.2031055-02	.0000000
.2817762-03	.3706815+03	-.6034752+04	-.5070308+04	.1923612-02	.0000000
.1059927-01	-.1381493-01	.5475140+04	.1310401+05	-.6048998-02	.0000000
.1576549-03	.0000000	.2490682+03	.8016721+04	.0000000	.0000000
.9518624-08	.0000000	-.4550394+04	-.5116019+04	.2657958-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.7388024-04	-.2523822-04	.9400431-05	-.8337654-04	-.1340766-04	.0000000
.5324211-03	.2679543+03	.1421132-04	.2747658+03	.1150492+03	.0000000
.3089137-03	.2747658+03	-.3644297+04	-.1885871+04	.1086943+03	.0000000
.2255225-02	-.8270455+03	.2400979+03	.2886229+04	-.3577796+03	.0000000
.8752643-04	.0000000	-.2646474+04	.1131803+04	.0000000	.0000000
.5645681-03	.0000000	-.2476708+04	-.1502618+04	.1530337+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.8956732-04	.1498366-04	-.8584420-05	.1836930-04	-.6540009-04	.0000000
-.1660390-02	.2648345+03	-.1029548-04	.3052867+03	-.1107905+03	.0000000
.4201480-03	.3052867+03	-.4115702+04	-.7544406+03	-.1062276+03	.0000000
-.1381033-02	.5387267+03	-.3121611+04	-.1625531+04	.2568909+03	.0000000
.6145728-04	.0000000	-.6083246+04	-.2145030+04	.0000000	.0000000
-.3966553-03	.0000000	-.2489475+04	.6722778+01	-.1330439+03	.0000000

THETA ANGLE= 5.49780 RADIANS

.4934920+00	.2827501+02	.1000000-01	.1701700-02	.2666954+02	.3000000+00
-.2618247-03	-.1658001-03	-.2154013-04	-.5973161-03	-.2660530-05	.0000000
-.2880510-02	.7132470+03	-.2877062-04	.7064351+03	-.2717243+03	.0000000
.5960376-03	.7064351+03	-.1341501+05	-.8894947+04	-.2589168+03	.0000000

.1832779-01	.1588881+04	.6635564+04	.2236677+05	.7210607+03	.0000000
.2379473-03	.0000000	-.4494567+04	-.1344989+05	.0000000	.0000000
-.1125496-02	.0000000	-.9600064+04	-.8685964+04	-.3411782+03	.0000000

THETA ANGLE= .00000 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.3739258-03	-.3084886-03	.0000000	-.1051064-02	-.8288141-04	.0000000
.0000000	-.2826034+03	.0000000	-.3668145+03	.0000000	.0000000
.8521260-03	-.3668145+03	-.1961400+05	-.1507125+05	.0000000	.0000000
.3335843-01	.0000000	.1504559+05	.4042197+05	.0000000	.0000000
-.2379369-03	.0000000	-.1696005+04	.2515809+05	.0000000	.0000000
.0000000	.0000000	-.1452915+05	-.1531368+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.2597192-03	-.1680442-03	.4717948-05	-.5914871-03	-.1345807-04	.0000000
.2948749-02	-.3850717+02	.4778446-04	-.5028506+02	-.2907671+02	.0000000
.6875438-03	-.5028506+02	-.1331703+05	-.8975066+04	-.5106496+02	.0000000
.1835904-01	-.1561142+04	.6986481+04	.2227358+05	-.1237938+04	.0000000
-.1042357-03	.0000000	-.4096517+04	.1330291+05	.0000000	.0000000
.1102289-02	.0000000	-.9578228+04	-.8731432+04	.1784355+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.9130292-04	.1405499-04	-.1191238-06	.1660706-04	.6323897-04	.0000000
.1699210-02	.2591743+03	.1737962-04	.3267286+03	-.3895925+02	.0000000
-.4145673-03	-.3267286+03	-.4196701+04	-.8114769+03	-.4699891+02	.0000000
-.1347205-02	-.5306322+03	-.3022298+04	-.1534506+04	-.4526325+03	.0000000
.7147986-04	.0000000	-.6055835+04	-.2107018+04	.0000000	.0000000
.3879834-03	.0000000	-.2557371+04	-.4000341+02	.4195999+02	.0000000

THETA ANGLE= 2.35620 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.7463496-04	-.2582503-04	-.4886364-05	-.8441256-04	.1135903-04	.0000000
-.5456902-03	.1499461+03	-.2320565-04	.1562236+03	-.2601990+02	.0000000
.3174619-03	.1562236+03	-.3677453+04	-.1916456+04	-.1540159+02	.0000000
.2288707-02	.8107042+03	.3298429+03	.2950047+04	.5978108+03	.0000000
.3921135-04	.0000000	-.2590213+04	.1166117+04	.0000000	.0000000
-.5535899-03	.0000000	-.2511010+04	-.1530190+04	-.1190937+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.1121760-03	-.1073584-03	.7155636-10	-.3339458-03	-.4778771-04	.0000000
.1321128-07	-.2386464+02	.3945272-09	-.7476210+02	.2642144-03	.0000000
.3287502-03	-.7476210+02	-.5981518+04	-.5088788+04	.8342316-04	.0000000
.1063134-01	-.1354976-01	.5631565+04	.1309413+05	-.1017855-01	.0000000
-.3507033-04	.0000000	.4341708+03	.7993901+04	.0000000	.0000000
.9330622-08	.0000000	-.4534543+04	-.5129499+04	.1880773-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.7463409-04	-.2582281-04	.4886365-05	-.8440587-04	.1136073-04	.0000000
.5456726-03	.1444508+03	.2320547-04	.1562301+03	.2602031+02	.0000000
.3174620-03	.1562301+03	-.3677397+04	-.1916371+04	.1540208+02	.0000000
.2288482-02	-.8106987+03	.3296955+03	.2949773+04	-.5978060+03	.0000000
.3921335-04	.0000000	-.2590304+04	.1165932+04	.0000000	.0000000
.5535859-03	.0000000	-.2510959+04	-.1530094+04	.1190932+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.9130485-04	.1405351-04	.1189819-06	.1660178-04	.6323871-04	.0000000
-.1699261-02	.2591724+03	-.1738066-04	.3267265+03	.3895930+02	.0000000
.4145712-03	.3267265+03	-.4196802+04	-.8115502+03	.4699943+02	.0000000
-.1347038-02	.5306671+03	-.3022229+04	-.1534305+04	.4526595+03	.0000000
.7147837-04	.0000000	-.6055851+04	-.2106891+04	.0000000	.0000000
-.3880078-03	.0000000	-.2557445+04	-.4007833+02	-.4196438+02	.0000000

THETA ANGLE= 5.49780 RADIANS

.5037022+00	.2886001+02	.1000000-01	.1701700-02	.2717439+02	.3000000+00
-.2597228-03	-.1680485-03	-.4717956-05	-.5915012-03	-.1345714-04	.0000000
-.2948732-02	-.3851457+02	-.4778428-04	-.5029462+02	.2907631+02	.0000000
.6875491-03	-.5029462+02	-.1331723+05	-.8975254+04	.5106447+02	.0000000
.1835950-01	.1561137+04	.6986726+04	.2227413+05	.1237933+04	.0000000
-.1042398-03	.0000000	-.4096449+04	.1330328+05	.0000000	.0000000
-.1102285-02	.0000000	-.9578383+04	-.8731634+04	-.1784351+03	.0000000

THETA ANGLE= .00000 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.3693177-03	-.3100221-03	.0000000	-.1038766-02	-.9061735-04	.0000000
.0000000	-.9322305+03	.0000000	-.1032089+04	.0000000	.0000000
.9332789-03	-.1032089+04	-.1941328+05	-.1511285+05	.0000000	.0000000
.3324222-01	.0000000	.1520365+05	.4004249+05	.0000000	.0000000
-.5383676-03	.0000000	-.1394615+04	.2477943+05	.0000000	.0000000
.0000000	.0000000	-.1491122+05	-.1529921+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.2574592-03	-.1692000-03	-.3186081-05	-.5847026-03	-.1855705-04	.0000000
.2980456-02	-.4095002+03	.5677366-04	-.4235534+03	-.1705596+03	.0000000
.7326770-03	-.4235534+03	-.1322022+05	-.9014965+04	-.1968871+03	.0000000
.1830111-01	-.1538491+04	.7104738+04	.2207350+05	-.1482242+04	.0000000
-.2733253-03	.0000000	-.3912761+04	.1308911+05	.0000000	.0000000
.1086693-02	.0000000	-.9526531+04	-.8735415+04	.1020831+03	.0000000

THETA ANGLE= 1.57080 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.9209862-04	.1352039-04	-.4241230-05	.1594255-04	.6196376-04	.0000000
.1717216-02	.2577447+03	.2072443-04	.3377289+03	-.1098606+03	.0000000
.4117017-03	.3377289+03	-.4234463+04	-.8427368+03	-.1195421+03	.0000000
-.1328094-02	-.5232619+03	-.2967669+04	-.1495099+04	-.5450693+03	.0000000
.7615436-04	.0000000	-.6035460+04	-.2095726+04	.0000000	.0000000
.3821787-03	.0000000	-.2589978+04	-.6455628+02	-.1204312+01	.0000000

THETA ANGLE= 2.35620 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.7479084-04	-.2614911-04	-.2809916-05	-.8423766-04	.1032961-04	.0000000
-.5519324-03	.8390735+02	-.2746451-04	.9796005+02	.1519261+02	.0000000
.3216960-03	.9796005+02	-.3685333+04	-.1932675+04	.2782826+02	.0000000
.2294860-02	.7984771+03	.3667272+03	.2955140+04	.7113873+03	.0000000
.1496408-04	.0000000	-.2562653+04	.1158019+04	.0000000	.0000000
-.5462030-03	.0000000	-.2521014+04	-.1541389+04	-.1037852+03	.0000000

THETA ANGLE= 3.14160 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.1109845-03	-.1077156-03	.2842920-10	-.3309956-03	-.4976414-04	.0000000
.1335804-07	-.2344394+03	.4674066-09	-.2945489+03	-.5584916-03	.0000000
.3520626-03	-.2945489+03	-.5928853+04	-.5096903+04	-.7739798-03	.0000000
.1060577-01	-.1334733-01	.5674538+04	.1300481+05	-.1213198-01	.0000000
-.1306613-03	.0000000	.5146647+03	.7906162+04	.0000000	.0000000
.9204206-08	.0000000	-.4503874+04	-.5125230+04	.1523881-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.7479001-04	-.2614690-04	.2809960-05	-.8423104-04	.1033134-04	.0000000
.5519145-03	.8391608+02	.2746429-04	.9797092+02	-.1519147+02	.0000000
.3216956-03	.9797092+02	-.3685279+04	-.1932591+04	-.2782702+02	.0000000

.2294636-02	-.7984717+03	.3665798+03	.2954869+04	-.7113817+03	.0000000
.1496799-04	.0000000	-.2562745+04	.1157836+04	.0000000	.0000000
.5461991-03	.0000000	-.2520965+04	-.1541293+04	.1037852+03	.0000000

THETA ANGLE= 4.71240 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.9210052-04	.1351890-04	.4241237-05	.1593735-04	.6196347-04	.0000000
-.1717268-02	.2577395+03	-.2072567-04	.3377235+03	.1098633+03	.0000000
.4117060-03	.3377235+03	-.4234562+04	-.8428104+03	.1195454+03	.0000000
-.1327927-02	.5232958+03	-.2967599+04	-.1494900+04	.5451015+03	.0000000
.7615136-04	.0000000	-.6035474+04	-.2095602+04	.0000000	.0000000
-.3822028-03	.0000000	-.2590051+04	-.6463110+02	.1201293+01	.0000000

THETA ANGLE= 5.49780 RADIANS

.5088072+00	.2915251+02	.1000000-01	.1701700-02	.2742575+02	.3000000+00
-.2574628-03	-.1692043-03	.3188036-05	-.5847165-03	-.1855920-04	.0000000
-.2980438-02	-.4095161+03	-.5677344-04	-.4235719+03	.1705584+03	.0000000
.7326834-03	-.4235719+03	-.1322041+05	-.9015152+04	.1968859+03	.0000000
.1830157-01	.1538486+04	.7104984+04	.2207405+05	.1482236+04	.0000000
-.2733335-03	.0000000	-.3912688+04	.1308946+05	.0000000	.0000000
-.1086689-02	.0000000	-.9526683+04	-.8735616+04	-.1020831+03	.0000000

THETA ANGLE= .00000 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.3674829-03	-.3105303-03	.0000000	-.1033703-02	-.9308740-04	.0000000
.0000000	-.1147814+04	.0000000	-.1252674+04	.0000000	.0000000
.9600704-03	-.1252674+04	-.1933450+05	-.1512623+05	.0000000	.0000000
.3318428-01	.0000000	.1524072+05	.3987735+05	.0000000	.0000000
-.6376389-03	.0000000	-.1299225+04	.2461822+05	.0000000	.0000000
.0000000	.0000000	-.1436162+05	-.1528934+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.2565307-03	-.1695883-03	-.5744985-05	-.5818768-03	-.2020956-04	.0000000
.2990683-02	-.5325013+03	.5968677-04	-.5472813+03	-.2163294+03	.0000000
-.7475647-03	-.5472813+03	-.1318099+05	-.9028166+04	-.2440631+03	.0000000
.1827099-01	-.1529689+04	.7135618+04	.2198436+05	-.1561406+04	.0000000
-.3292046-03	.0000000	-.3853924+04	.1299738+05	.0000000	.0000000
.1080929-02	.0000000	-.9503338+04	-.8733948+04	.7740462+02	.0000000

THETA ANGLE= 1.57080 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.9235405-04	.1333282-04	-.5580060-05	.1574928-04	.6151244-04	.0000000
.1723012-02	.2574921+03	.2180747-04	.3414497+03	-.1328817+03	.0000000
.4107339-03	.3414497+03	-.4246676+04	-.8535167+03	-.1430949+03	.0000000
-.1321425-02	-.5203290+03	-.2948776+04	-.1482747+04	-.5750054+03	.0000000
.7767224-04	.0000000	-.6027752+04	-.2092959+04	.0000000	.0000000
.3800343-03	.0000000	-.2600664+04	-.7290038+02	-.1523208+02	.0000000

THETA ANGLE= 2.35620 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.7481071-04	-.2626135-04	-.2146415-05	-.8407999-04	.9986929-05	.0000000
-.5539619-03	.6390195+02	-.2884595-04	.7868139+02	.2840547+02	.0000000
.3230909-03	.7868139+02	-.3686699+04	-.1938203+04	.4169526+02	.0000000
.2295359-02	.7938217+03	.3778316+03	.2952978+04	.7482151+03	.0000000
.6901578-05	.0000000	-.2553578+04	.1151694+04	.0000000	.0000000
-.5434718-03	.0000000	-.2523309+04	-.1544742+04	-.9894508+02	.0000000

THETA ANGLE= 3.14160 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.1104910-03	-.1078334-03	.1458247-10	-.3297056-03	-.5038182-04	.0000000
.1340558-07	-.3043633+03	.4910406-09	-.3674184+03	-.8231375-03	.0000000
.3597723-03	-.3674184+03	-.5907483+04	-.5099426+04	-.1049874-02	.0000000
.1059113-01	-.1326987-01	.5683646+04	.1296266+05	-.1276528-01	.0000000
-.1623089-03	.0000000	-.5396798+03	.7865733+04	.0000000	.0000000
.9157469-08	.0000000	-.4490312+04	-.5122181+04	.1409882-02	.0000000

THETA ANGLE= 3.92700 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.7480989-04	-.2625914-04	.2146473-05	-.8407340-04	.9988665-05	.0000000
.5539440-03	.6391202+02	.2884573-04	.7869370+02	-.2840409+02	.0000000
.3230904-03	.7869370+02	-.3686645+04	-.1938119+04	-.4169377+02	.0000000
.2295135-02	-.7938163+03	.3776843+03	.2952708+04	-.7482092+03	.0000000
.6906126-05	.0000000	-.2553671+04	.1151511+04	.0000000	.0000000
.5434678-03	.0000000	-.2523260+04	-.1544646+04	.9894524+02	.0000000

THETA ANGLE= 4.71240 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.9235595-04	.1333133-04	-.5580113-05	.1574410-04	.6151213-04	.0000000
-.1723064-02	.2574859+03	-.2180877-04	.3414431+03	.1328853+03	.0000000
.4107383-03	.3414431+03	-.4246774+04	-.8535905+03	.1430991+03	.0000000
-.1321259-02	.5203632+03	-.2948706+04	-.1482550+04	.5750394+03	.0000000
.7766874-04	.0000000	-.6027766+04	-.2092836+04	.0000000	.0000000
-.3800582-03	.0000000	-.2600737+04	-.7297526+02	.1522949+02	.0000000

THETA ANGLE= 5.49780 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.2565341-03	-.1695926-03	.5744927-05	-.5818907-03	-.2021174-04	.0000000
-.2990665-02	-.5325201+03	-.5968655-04	-.5473028+03	.2163280+03	.0000000
.7475715-03	-.5473028+03	-.1318118+05	-.9028354+04	.2440616+03	.0000000
.1827145-01	.1529683+04	.7135865+04	.2198491+05	.1561400+04	.0000000
-.3292141-03	.0000000	-.3853851+04	.1299774+05	.0000000	.0000000
-.1080925-02	.0000000	-.9503489+04	-.8734149+04	-.7740478+02	.0000000

SEGMENT NUMBER 2 SEGMENT CODE 11 SECOND PART OF REG. NO. 2

TABLE ORDER PHI OR S VS. CROSSECTION PROPERTIES

.5105088+00	.6806784+00
.1000000+08	.1000000+08
.1000000+08	.1000000+08
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+01	.1000000+01
.1000000+00	.1000000+00
.1000000+00	.1000000+00
.1000000+00	.1000000+00

PROBLEM 1 TABLE ORDER PHI OR S VS. DISTRIBUTED LOADS (F THETA, F PHI, F ZETA, M THETA, M PHI)

LOAD IDENTIFICATION CLUES 000100

.1000000+04	.1000000+04				
PHI (RAD. OR IN.)	DEGREES	PRINT INTERVAL	STEP	R ZERO	BASE THICKNESS
EPSILON THETA	EPSILON PHI	GAMMA PHI THETA	K PHI	K THETA	N TEMPERATURE THETA
U	Q PHI	K PHI THETA	J PHI STAR	T PHI THETA	N TEMPERATURE PHI
V	J PHI	N THETA	N PHI	N PHI THETA	M TEMPERATURE THETA
W	Q THETA	M THETA	M PHI	M PHI THETA	M TEMPERATURE PHI
OMEGA THETA	TAU ZETA PHI = Q/T	SIGMA THETA IN	SIGMA PHI IN	TAU PHI THETA IN	SIGMA F IN
OMEGA PHI	TAU ZETA THETA = Q/T	SIGMA THETA OUT	SIGMA PHI OUT	TAU PHI THETA OUT	SIGMA F OUT

THETA ANGLE= .00000 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.3674829-03	-.5186411-03	.0000000	-.1377957-02	-.9308741-04	.0000000
.0000000	-.1212831+04	.0000000	-.1252672+04	.0000000	.0000000
.9600700-03	-.1252672+04	-.1369029+05	-.1512622+05	.0000000	.0000000
.3318428-01	.0000000	.1715136+04	.3987735+05	.0000000	.0000000
-.6376395-03	.0000000	-.8231864+04	.2577948+05	.0000000	.0000000
.0000000	.0000000	-.8231864+04	.2577948+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.2565307-03	-.3032199-03	-.9074108-04	-.7614065-03	-.2020956-04	.0000000
.2990683-02	-.5417573+03	.5893196-04	-.5472803+03	-.2163285+03	.0000000

.7475646-03	-.5472803+03	-.9617632+04	-.9028169+04	-.2268527+03	.0000000
.1827099-01	-.5935164+03	-.1516261+03	.2198436+05	-.5925117+03	.0000000
-.3292047-03	.0000000	-.7089633+04	.1374560+05	.0000000	.0000000
.1080929-02	.0000000	-.7089633+04	.1374560+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.9235409-04	-.1641741-04	-.5467916-04	.4764797-04	.6151245-04	.0000000
.1723012-02	.3094191+03	.2137142-04	.3414498+03	-.1328814+03	.0000000
.4107340-03	.3414498+03	-.3552895+04	-.8535176+03	-.1366979+03	.0000000
-.1321423-02	-.1719375+03	-.2127246+04	-.1482750+04	-.2148719+03	.0000000
.7767273-04	.0000000	-.4615996+04	-.1921961+04	.0000000	.0000000
.3800343-03	.0000000	-.4615996+04	-.1921961+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.7481072-04	-.5950753-04	.1341267-04	-.1041527-03	.9986933-05	.0000000
-.5539620-03	.7315806+02	-.2870780-04	.7868093+02	.2840498+02	.0000000
.3230909-03	.7868093+02	-.2816234+04	-.1938203+04	.3353167+02	.0000000
.2295359-02	.3503556+03	-.5233060+03	.2952977+04	.2886330+03	.0000000
.6901727-05	.0000000	-.2543930+04	.1339357+04	.0000000	.0000000
-.5434717-03	.0000000	-.2543930+04	.1339357+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.1104910-03	-.1739770-03	-.3640880-09	-.4484517-03	-.5038182-04	.0000000
.1340558-07	-.3431993+03	.4876780-09	-.3674189+03	-.8231294-03	.0000000
.3597721-03	-.3674189+03	-.4071625+04	-.5099425+04	-.9102199-03	.0000000
.1059113-01	-.5680780-02	.1189465+04	.1296267+05	-.4903196-02	.0000000
-.1623091-03	.0000000	-.1803276+04	.8234240+04	.0000000	.0000000
.9157468-08	.0000000	-.1803276+04	.8234240+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.7480990-04	-.5950447-04	-.1341210-04	-.1041435-03	.9988669-05	.0000000
.5539441-03	.7316952+02	.2870758-04	.7869325+02	-.2840360+02	.0000000
.3230904-03	.7869325+02	-.2816206+04	-.1938119+04	-.3353025+02	.0000000
.2295136-02	-.3503538+03	-.5233558+03	.2952707+04	-.2886308+03	.0000000
.6906275-05	.0000000	-.2543957+04	.1339170+04	.0000000	.0000000
.5434677-03	.0000000	-.2543957+04	.1339170+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.9235598-04	-.1641994-04	.5468070-04	.4764113-04	.6151213-04	.0000000
-.1723064-02	.3094127+03	-.2137271-04	.3414432+03	.1328850+03	.0000000
.4107384-03	.3414432+03	-.3552966+04	-.8535913+03	.1367017+03	.0000000
-.1321257-02	.1719514+03	-.2127242+04	-.1482552+04	.2148848+03	.0000000
.7766923-04	.0000000	-.4616043+04	-.1921832+04	.0000000	.0000000
-.3800582-03	.0000000	-.4616043+04	-.1921832+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5105088+00	.2925000+02	.1000000-01	.1701700-02	.2750937+02	.3000000+00
-.2565341-03	-.3032265-03	.9074051-04	-.7614255-03	-.2021174-04	.0000000
-.2990665-02	-.5417778+03	-.5893173-04	-.5473018+03	.2163271+03	.0000000
.7475714-03	-.5473018+03	-.9617760+04	-.9028352+04	.2268513+03	.0000000
.1827145-01	.5935146+03	-.1515708+03	.2198491+05	.5925095+03	.0000000
-.3292142-03	.0000000	-.7089672+04	.1374597+05	.0000000	.0000000
-.1080928-02	.0000000	-.7089672+04	.1374597+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.3602375-03	-.5135147-03	.0000000	-.1319781-02	-.1126512-03	.0000000
.0000000	-.2587657+04	.0000000	-.2641945+04	.0000000	.0000000
.9994560-03	-.2641945+04	-.1336255+05	-.1510586+05	.0000000	.0000000
.3258294-01	.0000000	-.2324324+04	.3814376+05	.0000000	.0000000
-.1919177-02	.0000000	-.7427588+04	.2418798+05	.0000000	.0000000
.0000000	.0000000	-.7427588+04	.2418798+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.2519466-03	-.3012660-03	-.1599270-03	-.7306776-03	-.3271441-04	.0000000
.2982379-02	-.1319326+04	.8172124-04	-.1321804+04	-.3852236+03	.0000000
.7589007-03	-.1321804+04	-.9411504+04	-.9043792+04	-.3998176+03	.0000000
.1794976-01	-.5793653+03	.2377022+03	.2106645+05	-.8216390+03	.0000000
-.7587132-03	.0000000	-.6576966+04	.1288235+05	.0000000	.0000000
.1039894-02	.0000000	-.6576966+04	.1288235+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.9159050-04	-.1831394-04	-.9209362-04	.4248947-04	.5902698-04	.0000000
.1718093-02	.3294882+03	.2946239-04	.3732003+03	-.2249726+03	.0000000
.3874973-03	.3732003+03	-.3520129+04	-.9058368+03	-.2302341+03	.0000000
-.1273260-02	-.1696851+03	-.2050153+04	-.1333302+04	-.2962198+03	.0000000
.1035863-03	.0000000	-.4518524+04	-.1824102+04	.0000000	.0000000
.3650948-03	.0000000	-.4518524+04	-.1824102+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.7418400-04	-.5986822-04	.2968624-04	-.1022396-03	.7589708-05	.0000000
-.5526157-03	-.4941186+02	-.4005458-04	-.4193404+02	.6706258+02	.0000000
.3121563-03	-.4193404+02	-.2786774+04	-.1956239+04	.7421561+02	.0000000
.2278950-02	.3393902+03	-.4493726+03	.2894402+04	-.4027154+03	.0000000
-.5252739-04	.0000000	-.2453211+04	.1271141+04	.0000000	.0000000
-.5235644-03	.0000000	-.2453211+04	.1271141+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.1088421-03	-.1721240-03	-.7176570-09	-.4310272-03	-.5565119-04	.0000000
.1337077-07	-.7987816+03	-.6793476-09	-.8319178+03	-.1672823-02	.0000000
.3676620-03	-.8319178+03	-.3993728+04	-.5082464+04	-.1794143-02	.0000000
.1042087-01	-.5512521-02	-.1352614+04	.1244438+05	-.6830274-02	.0000000
-.4154707-03	.0000000	-.1595728+04	.7767097+04	.0000000	.0000000
.8818926-08	.0000000	-.1595728+04	.7767097+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.7418320-04	-.5986522-04	-.2968529-04	-.1022307-03	.7591515-05	.0000000
.5525978-03	-.4939144+02	.4005427-04	-.4191245+02	-.6706025+02	.0000000
.3121552-03	-.4191245+02	-.2786747+04	-.1956151+04	-.7421322+02	.0000000
.2278730-02	-.3393885+03	-.4494247+03	.2894145+04	-.4027123+03	.0000000
-.5251762-04	.0000000	-.2453242+04	.1270965+04	.0000000	.0000000
.5235607-03	.0000000	-.2453242+04	.1270965+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.9159235-04	-.1831645-04	.9209641-04	.4248293-04	.5902656-04	.0000000
-.1718145-02	.3294758+03	-.2946418-04	.3731870+03	.2249793+03	.0000000
.3875020-03	.3731870+03	-.3520198+04	-.9059105+03	.2302410+03	.0000000
-.1273097-02	.1496986+03	-.2050146+04	-.1333113+04	.2962378+03	.0000000
.1035790-03	.0000000	-.4518567+04	-.1823981+04	.0000000	.0000000
-.3651178-03	.0000000	-.4518567+04	-.1823981+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5207190+00	.2983500+02	.1000000-01	.1701700-02	.2800947+02	.3000000+00
-.2519500-03	-.3012725-03	.1599261-03	-.7306957-03	-.3271681-04	.0000000
-.2982361-02	-.1314365+04	-.8172094-04	-.1321844+04	.3852213+03	.0000000

.7589083-03	-.1321844+04	-.9411629+04	-.9043979+04	.3998152+03	.0000000
.1795021-01	.5793637+03	.2377643+03	-.2106697+05	.8216359+03	.0000000
-.7587333-03	.0000000	-.6576997+04	.1288270+05	.0000000	.0000000
-.1039890-02	.0000000	-.6576997+04	.1288270+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.3476870-03	-.9066380-03	.0000000	-.1237655-02	-.1292566-03	.0000000
.0000000	-.3944904+04	.0000000	-.4011499+04	.0000000	.0000000
.1033906-02	-.4011499+04	-.1284918+05	-.1508727+05	.0000000	.0000000
.3154579-01	.0000000	.2860149+04	.3869528+05	.0000000	.0000000
-.2150362-02	.0000000	-.6552910+04	.2193051+05	.0000000	.0000000
.0000000	.0000000	-.6552910+04	.2193051+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.2436650-03	-.2983542-03	-.2229767-03	-.6863977-03	-.4387277-04	.0000000
.2935261-02	-.2076500+04	-.1020015+03	-.2085643+04	-.5392262+03	.0000000
.7671121-03	-.2085643+04	-.9074181+04	-.9060728+04	-.5574418+03	.0000000
.1738737-01	-.5550889+03	.5974535+03	.1974394+05	-.1025540+04	.0000000
-.1166646-02	.0000000	-.5993768+04	.1164131+05	.0000000	.0000000
.9868193-03	.0000000	-.5993768+04	.1164131+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.8949756-04	-.2029019-04	-.1263168-03	.3716623-04	.5589771-04	.0000000
.1691758-02	.3502855+03	.3666249-04	.4039494+03	-.3092448+03	.0000000
.3637119-03	.4039494+03	-.3437342+04	-.9588901+03	-.3157921+03	.0000000
-.1210821-02	-.1640170+03	-.1949712+04	-.1179131+04	-.3686108+03	.0000000
.1264899-03	.0000000	-.4361858+04	-.1723693+04	.0000000	.0000000
.3459533-03	.0000000	-.4361858+04	-.1723693+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.7245694-04	-.6010812-04	.4433671-04	-.9810114-04	.5246969-05	.0000000
-.5427403-03	-.1700541+03	-.5015221-04	-.1609111+03	.1018855+03	.0000000
.3007080-03	-.1609111+03	-.2717440+04	-.1975187+04	.1108418+03	.0000000
.2228932-02	.3231297+03	-.3738067+03	.2769281+04	.5042387+03	.0000000
-.1102136-03	.0000000	-.2331117+04	.1139791+04	.0000000	.0000000
-.4975606-03	.0000000	-.2331117+04	.1139791+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.1055612-03	-.1697045-03	-.1037609-08	-.4056704-03	-.5978939-04	.0000000
.1314514-07	-.1248757+04	.8499162-09	-.1289490+04	-.2442242-02	.0000000
.3743089-03	-.1289490+04	-.3859356+04	-.5066727+04	-.2594022-02	.0000000
.1010833-01	-.9255915-02	.1486540+04	.1168927+05	-.8545199-02	.0000000
-.6563278-03	.0000000	-.1373154+04	.7078977+04	.0000000	.0000000
.8377844-08	.0000000	-.1373154+04	.7078977+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.7245619-04	-.6010520-04	-.4433540-04	-.9809285-04	.5248818-05	.0000000
.5427227-03	-.1700248+03	.5015183-04	-.1608804+03	-.1018823+03	.0000000
.3007065-03	-.1608804+03	-.2717415+04	-.1975105+04	-.1108385+03	.0000000
.2228719-02	-.3231280+03	-.3738602+03	.2769040+04	-.5042348+03	.0000000
-.1101989-03	.0000000	-.2331150+04	.1139629+04	.0000000	.0000000
.4975570-03	.0000000	-.2331150+04	.1139629+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.8949934-04	-.2029267-04	.1263208-03	.3716011-04	.5589720-04	.0000000
-.1691809-02	.3502657+03	-.3666473-04	.4039294+03	.3092542+03	.0000000
.3637167-03	.4039294+03	-.3437408+04	-.9589639+03	.3158019+03	.0000000
-.1210663-02	.1640299+03	-.1949702+04	-.1178955+04	.3686333+03	.0000000
.1264789-03	.0000000	-.4361896+04	-.1723584+04	.0000000	.0000000
-.3459752-03	.0000000	-.4361896+04	-.1723584+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5309292+00	.3042000+02	.1000000-01	.1701700-02	.2850665+02	.3000000+00
-.2436683-03	-.2983606-03	.2229754-03	-.6864147-03	-.4387534-04	.0000000
-.2935243-02	-.2076557+04	-.1020011-03	-.2085702+04	.5392230+03	.0000000
.7671206-03	-.2085702+04	-.9074300+04	-.9060914+04	.5574386+03	.0000000
.1738780-01	.5550872+03	.5975211+03	.1974443+05	.1025536+04	.0000000
-.1166676-02	.0000000	-.5993789+04	.1164162+05	.0000000	.0000000
-.9868158-03	.0000000	-.5993789+04	.1164162+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.3301039-03	-.4979843-03	.0000000	-.1132108-02	-.1427686-03	.0000000
.0000000	-.5288089+04	.0000000	-.5364816+04	.0000000	.0000000
.1060117-02	-.5364816+04	-.1216044+05	-.1506824+05	.0000000	.0000000
.3010000-01	.0000000	.3317745+04	.3254788+05	.0000000	.0000000
-.2832583-02	.0000000	-.5620057+04	.1902372+05	.0000000	.0000000
.0000000	.0000000	-.5620057+04	.1902372+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.2319315-03	-.2944514-03	-.2793873-03	-.6288956-03	-.5355049-04	.0000000
.2852286-02	-.2830386+04	.1195394-03	-.2840899+04	-.6771207+03	.0000000
.7703678-03	-.2840899+04	-.8614928+04	-.9077092+04	-.6984683+03	.0000000
.1659847-01	-.5213280+03	.9228625+03	.1802682+05	-.1201869+04	.0000000
-.1545310-02	.0000000	-.5351429+04	.1003332+05	.0000000	.0000000
.9231967-03	.0000000	-.5351429+04	.1003332+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.8624994-04	-.2231072-04	-.1570767-03	.3162611-04	.5223212-04	.0000000
.1645552-02	.3719975+03	.4288525-04	.4334561+03	-.3850332+03	.0000000
.3394791-03	.4334561+03	-.3311145+04	-.1011454+04	-.3926918+03	.0000000
-.1135862-02	-.1550911+03	-.1829678+04	-.1018564+04	-.4311754+03	.0000000
.1462736-03	.0000000	-.4154462+04	-.1618105+04	.0000000	.0000000
.3231370-03	.0000000	-.4154462+04	-.1618105+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.6972462-04	-.6020823-04	.5724596-04	-.9180519-04	.3004887-05	.0000000
-.5251108-03	-.2892374+03	-.5888966-04	-.2787248+03	.1325983+03	.0000000
.2884845-03	-.2787248+03	-.2611792+04	-.1994289+04	.1431149+03	.0000000
.2146678-02	.3019922+03	-.2982807+03	.2579706+04	.5920865+03	.0000000
-.1648979-03	.0000000	-.2181885+04	.9479087+03	.0000000	.0000000
-.4662056-03	.0000000	-.2181885+04	.9479087+03	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.1007078-03	-.1667118-03	-.1321376-08	-.3725409-03	-.6278579-04	.0000000
.1274482-07	-.1694329+04	.9974860-09	-.1741320+04	-.3125306-02	.0000000
.3786281-03	-.1741320+04	-.3670691+04	-.5051564+04	-.3303439-02	.0000000
.9661897-02	-.4917596-02	.1590746+04	.1070217+05	-.1002889-01	.0000000
-.8803681-03	.0000000	-.1137661+04	.6174874+04	.0000000	.0000000
.7846798-08	.0000000	-.1137661+04	.6174874+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.6972392-04	-.6020540-04	-.5724433-04	-.9179762-04	.3006748-05	.0000000
.5250937-03	-.2891993+03	.5888922-04	-.2786851+03	-.1325943+03	.0000000

.2884825-03	-.2786851+03	-.2611769+04	-.1994208+04	-.1431108+03	.0000000
.2146476-02	-.3019906+03	-.2983347+03	.2579487+04	-.5920820+03	.0000000
-.1648786-03	.0000000	-.2181920+04	.9477667+03	.0000000	.0000000
.4662022-03	.0000000	-.2181920+04	.9477667+03	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.8625162-04	-.2231315-04	.1570817-03	.3162053-04	.5223153-04	.0000000
-.1645602-02	.3715710+03	-.4288787+04	.4334295+03	.3850452+03	.0000000
.3394841+03	.4334295+03	-.3311207+04	-.1011528+04	.3927042+03	.0000000
-.1135711-02	.1551032+03	-.1829665+04	-.1018404+04	.4312018+03	.0000000
.1462592-03	.0000000	-.4154495+04	-.1618010+04	.0000000	.0000000
-.3231575-03	.0000000	-.4154495+04	-.1618010+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5411393+00	.3100500+02	.1000000-01	.1701700-02	.2900086+02	.3000000+00
-.2319345-03	-.2944577-03	.2793857-03	-.6289110-03	-.5355318-04	.0000000
-.2852269-02	-.2830461+04	-.1195389-03	-.2840976+04	.6771167+03	.0000000
.7703769-03	-.2840976+04	-.8615040+04	-.9077277+04	.6984642+03	.0000000
.1659888-01	.5213264+03	.9229344+03	.1802727+05	-.1201864+04	.0000000
-.1545349-02	.0000000	-.5351441+04	.1003360+05	.0000000	.0000000
-.9231934-03	.0000000	-.5351441+04	.1003360+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.3078834-03	-.4875281-03	.0000000	-.1003574-02	-.1530859-03	.0000000
.0000000	-.6620463+04	.0000000	-.6705117+04	.0000000	.0000000
.1075116-02	-.6705117+04	-.1131092+05	-.1504703+05	.0000000	.0000000
.2828054-01	.0000000	.3692882+04	.2871466+05	.0000000	.0000000
-.3447507-02	.0000000	-.4643924+04	.1548138+05	.0000000	.0000000
.0000000	.0000000	-.4643924+04	.1548138+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701708-02	.2949204+02	.3000000+00
-.2170598-03	-.2895275-03	-.3287277-03	-.5584420-03	-.6163367-04	.0000000
.2736724-02	-.3577918+04	.1341258-03	-.3589502+04	-.7978669+03	.0000000
.7670271-03	-.3589502+04	-.8045427+04	-.9091370+04	-.8218193+03	.0000000
.1560212-01	-.4786603+03	.1209566+04	.1592332+05	-.1348523+04	.0000000
-.1887186-02	.0000000	-.4662785+04	.8067436+04	.0000000	.0000000
.8606402-03	.0000000	-.4662785+04	.8067436+04	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.8201925-04	-.2434455-04	-.1841579-03	.2582358-04	.4813569-04	.0000000
.1581191-02	.3932364+03	.4805350-04	.4615184+03	-.4518131+03	.0000000
.3149011-03	.4615184+03	-.3148036+04	-.1062485+04	-.4603946+03	.0000000
-.1050210-02	-.1430477+03	-.1693737+04	-.8501412+03	-.4831379+03	.0000000
.1627991-03	.0000000	-.3904648+04	-.1505049+04	.0000000	.0000000
.2972180-03	.0000000	-.3904648+04	-.1505049+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.6609291-04	-.6015145-04	.6828760-04	-.8340693-04	.9056914-06	.0000000
-.5005706-03	-.4073889+03	-.6616700-04	-.3958056+03	.1589028+03	.0000000
.2752519-03	-.3958056+03	-.2473774+04	-.2012885+04	.1707190+03	.0000000
.2034276-02	.2763568+03	-.2243813+03	.2327389+04	.6652540+03	.0000000
-.2153564-03	.0000000	-.2009958+04	.6976643+03	.0000000	.0000000
-.4303046-03	.0000000	-.2009958+04	.6976643+03	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.9938305-04	-.1631389-03	-.1566441-08	-.3317670-03	-.6464042-04	.0000000
.1218744-07	-.2136606+04	.1120351-08	-.2188506+04	-.3716027-02	.0000000
.3796379-03	-.2188506+04	-.3431388+04	-.5036463+04	-.3916102-02	.0000000
.9092548-02	-.4503573-02	.1664933+04	.9486931+04	-.1126419-01	.0000000
-.1083162-02	.0000000	-.8922790+03	.5058842+04	.0000000	.0000000
.7239386-08	.0000000	-.8922790+03	.5058842+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.6609227-04	-.6014872-04	-.6828569-04	-.8340023-04	.9075383-06	.0000000
.5005541-03	-.4073921+03	.6616650-04	-.3957570+03	-.1588981+03	.0000000
.2752495-03	-.3957570+03	-.2473753+04	-.2012806+04	-.1707142+03	.0000000
.2034086-02	-.2763553+03	-.2244350+03	.2327195+04	-.6652490+03	.0000000
-.2153330-03	.0000000	-.2009994+04	.6975454+03	.0000000	.0000000
.4303015-03	.0000000	-.2009994+04	.6975454+03	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5513495+00	.3159000+02	.1000000-01	.1701700-02	.2949204+02	.3000000+00
-.8202082-04	-.2434693-04	.1841637-03	.2581864-04	.4813504-04	.0000000
-.1581238-02	.3932034+03	-.4805645-04	.4614852+03	.4518272+03	.0000000
.3149062-03	.4614852+03	-.3148094+04	-.1062558+04	.4604092+03	.0000000
-.1050069-02	.1430588+03	-.1693722+04	-.8499999+03	.4831676+03	.0000000
.1627818-03	.0000000	-.3904676+04	-.1504967+04	.0000000	.0000000
-.2972369-03	.0000000	-.3904676+04	-.1504967+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5513495+00	.3159080+02	.1000000-01	.1701708-02	.2949204+02	.3000000+00
-.2170627-03	-.2895336-03	.3287258-03	-.5584557-03	-.6163644-04	.0000000
-.2736708-02	-.3578012+04	-.1341253-03	-.3589598+04	.7978622+03	.0000000
.7670368-03	-.3589598+04	-.8045530+04	-.9091553+04	.8218145+03	.0000000
-.1560251-01	.4786588+03	-.1209641+04	-.1592372+05	.1348518+04	.0000000
-.1887234-02	.0000000	-.4662788+04	.8067663+04	.0000000	.0000000
-.8506371-03	.0000000	-.4662788+04	.8067663+04	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.2815423-03	-.4752461-03	.0000000	-.8523992-03	-.1601357-03	.0000000
.0000000	-.7944933+04	.0000000	-.8035334+04	.0000000	.0000000
.1076343-02	-.8035334+04	-.1031956+05	-.1502240+05	.0000000	.0000000
.2613001-01	.0000000	.3981828+04	.2420612+05	.0000000	.0000000
-.3982022-02	.0000000	-.3642200+04	.1131459+05	.0000000	.0000000
.0000000	.0000000	-.3642200+04	.1131459+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.1994312-03	-.2835555-03	-.3706615-03	-.4752560-03	-.6802585-04	.0000000
.2592118-02	-.4320845+04	.1455716-03	-.4333199+04	-.9006574+03	.0000000
.7556824-03	-.4333199+04	-.7379747+04	-.9102410+04	-.9266538+03	.0000000
-.1442166-01	-.4276028+03	.1453524+04	.1344011+05	-.1463601+04	.0000000
-.2184894-02	.0000000	-.3942160+04	.5751013+04	.0000000	.0000000
.7708757-03	.0000000	-.3942160+04	.5751013+04	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.7697303-04	-.2636488-04	-.2074064-03	.1971902-04	.4371167-04	.0000000
.1500530-02	.4150450+03	.5209772-04	.4879741+03	-.5092124+03	.0000000
.2900777-03	.4879741+03	-.2954363+04	-.1111100+04	-.5185161+03	.0000000
-.9657813-03	-.1280101+03	-.1545496+04	-.6725923+03	-.5237991+03	.0000000
.1759042-03	.0000000	-.3620541+04	-.1382517+04	.0000000	.0000000
.2688090-03	.0000000	-.3620541+04	-.1382517+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.6167746-04	-.5992269-04	.7734277-04	-.7295039-04	-.1011874-05	.0000000
-.4700358-03	-.5248911+03	-.7189330-04	-.5125374+03	.1805181+03	.0000000

.2608108+03	-.5125374+03	-.2307676+04	-.2030443+04	.1933569+03	.0000000
.1894512-02	.2465660+03	-.1536198+03	.2013697+04	.7228272+03	.0000000
-.2603938+03	.0000000	-.1819968+04	.3908310+03	.0000000	.0000000
-.3907171-03	.0000000	-.1819968+04	.3908310+03	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5615597+00	.3217500+02	.1000000-01	-.1701700-02	.2998015+02	.3000000+00
-.8672890-04	-.1589790-03	-.1770585-08	-.2834481-03	-.6536213-04	.0000000
.1149219-07	-.2576595+04	.1216980-08	-.2632052+04	-.4209136-02	.0000000
.3764857-03	-.2632052+04	-.3146542+04	-.5021055+04	-.4426463-02	.0000000
.8413789-02	-.4019263-02	.1708943+04	.8046583+04	-.1223552-01	.0000000
-.1260345-02	.0000000	-.6409882+03	.3734073+04	.0000000	.0000000
.6570124-08	.0000000	-.6409882+03	.3734073+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.6167690-04	-.5992006-04	-.7734061-04	-.7294471-04	-.1010068-05	.0000000
.4700203-03	-.5248356+03	.7189276+04	-.5124799+03	-.1805128+03	.0000000
.2608080-03	-.5124799+03	-.2307657+04	-.2030369+04	-.1933515+03	.0000000
.1894336-02	-.2465647+03	-.1536725+03	.2013534+04	-.7228218+03	.0000000
-.2603669-03	.0000000	-.1820005+04	.3907395+03	.0000000	.0000000
.3907143-03	.0000000	-.1820005+04	.3907395+03	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.7697446-04	-.2636720-04	.2074130-03	.1971483-04	.4371097-04	.0000000
-.1500576-02	.4150055+03	-.5210092-04	.4879344+03	.5092283+03	.0000000
.2900828-03	.4879344+03	-.2954416+04	-.1111174+04	.5185326+03	.0000000
-.9556512-03	.1280200+03	-.1545479+04	-.6724734+03	.5238313+03	.0000000
.1758842-03	.0000000	-.3620563+04	-.1382461+04	.0000000	.0000000
-.2688261-03	.0000000	-.3620563+04	-.1382461+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5615597+00	.3217500+02	.1000000-01	.1701700-02	.2998015+02	.3000000+00
-.1994338-03	-.2835615-03	.3706594-03	-.4752676-03	-.6802864-04	.0000000
-.2592103-02	-.4320956+04	-.1455710-03	-.4333312+04	.9006521+03	.0000000
.7556924-03	-.4333312+04	-.7379840+04	-.9102592+04	.9266485+03	.0000000
.1442202-01	.4276015+03	.1453600+04	.1344044+05	.1463596+04	.0000000
-.2184949-02	.0000000	-.3942154+04	.5751183+04	.0000000	.0000000
-.7708729-03	.0000000	-.3942154+04	.5751183+04	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.2517191-03	-.4611184-03	.0000000	-.6788553-03	-.1638696-03	.0000000
.0000000	-.9264132+04	.0000000	-.9358070+04	.0000000	.0000000
.1061722-02	-.9358070+04	-.9209608+04	-.1499363+05	.0000000	.0000000
.2369850-01	.0000000	.4181219+04	.1903049+05	.0000000	.0000000
-.4423197-02	.0000000	-.2635486+04	.6532106+04	.0000000	.0000000
.0000000	.0000000	-.2635486+04	.6532106+04	.0000000	.0000000

THETA ANGLE= .7854D RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.1794928-03	-.2765129-03	-.4049678-03	-.3795109-03	-.7264574-04	.0000000
.2422227-02	-.5060705+04	-.1537034-03	-.5073529+04	-.9849707+03	.0000000
.7352003-03	-.5073529+04	-.6634319+04	-.9109427+04	-.1012419+04	.0000000
.1308467-01	-.3686164+03	.1658952+04	.1058247+05	-.1545360+04	.0000000
-.2431166-02	.0000000	-.3205413+04	.3089939+04	.0000000	.0000000
.6857308-03	.0000000	-.3205413+04	.3089939+04	.0000000	.0000000

THETA ANGLE= 1.5708D RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.7127301-04	-.2834878-04	-.2267348-03	.1327787-04	.3906098-04	.0000000
.1405534-02	-.4368987+03	.5495449-04	.5127009+03	-.5570231+03	.0000000
.2651028-03	.5127009+03	-.2736265+04	-.1156568+04	-.5668370+03	.0000000
-.8545920-03	-.1100864+03	-.1388473+04	-.4848104+03	-.5525216+03	.0000000
.1854050-03	.0000000	-.3310020+04	-.1248799+04	.0000000	.0000000
.2385595-03	.0000000	-.3310020+04	-.1248799+04	.0000000	.0000000

THETA ANGLE= 2.3562D RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.5660281-04	-.5950886-04	.8431438-04	-.6046975-04	-.2712163-05	.0000000
-.4344912-03	-.6420779+03	-.7598500-04	-.6292542+03	.1972164+03	.0000000
.2450015-03	-.6292542+03	-.2118102+04	-.2046540+04	.2107859+03	.0000000
.1730852-02	.2129280+03	-.8744104+02	.1639697+04	.7639658+03	.0000000
-.2988374-03	.0000000	-.1616719+04	.2882680+02	.0000000	.0000000
-.3483520-03	.0000000	-.1616719+04	.2882680+02	.0000000	.0000000

THETA ANGLE= 3.1416D RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.7792573-04	-.1542260-03	-.1932114-08	-.2276590-03	-.6496717-04	.0000000
.1067941-07	-.3015192+04	.1285892-08	-.3072858+04	-.4600647-02	.0000000
.3684732-03	-.3072858+04	-.2822689+04	-.5005122+04	-.4830284-02	.0000000
.7641632-02	-.3469528-02	.1722720+04	.6383385+04	-.1292857-01	.0000000
-.1407602-02	.0000000	-.3887568+03	.2202989+04	.0000000	.0000000
.5854369-08	.0000000	-.3887568+03	.2202989+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.5660234-04	-.5950635-04	-.8431202-04	-.6046524-04	-.2710422-05	.0000000
.4344766-03	-.6420138+03	.7598443-04	-.6291881+03	-.1972106+03	.0000000
.2449985-03	-.6291881+03	-.2118087+04	-.2046462+04	-.2107801+03	.0000000
.1730693-02	-.2129268+03	-.8749202+02	-.1639569+04	-.7639601+03	.0000000
-.2988075-03	.0000000	-.1616758+04	.2876687+02	.0000000	.0000000
.3483498-03	.0000000	-.1616758+04	.2876687+02	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.7127428-04	-.2835103-04	.2267420-03	.1327455-04	.3906025-04	.0000000
-.1405576-02	.4368527+03	-.5495787-04	.5126547+03	.5570405+03	.0000000
.2651079-03	.5126547+03	-.2736312+04	-.1156641+04	.5668550+03	.0000000
-.8544739-03	.1100950+03	-.1388455+04	-.4847173+03	.5525556+03	.0000000
.1853828-03	.0000000	-.3310036+04	-.1248767+04	.0000000	.0000000
-.2385747-03	.0000000	-.3310036+04	-.1248767+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5717699+00	.3276000+02	.1000000-01	.1701700-02	.3046513+02	.3000000+00
-.1794951-03	-.2765186-03	.4049654-03	-.3795201-03	-.7264851-04	.0000000
-.2422212-02	-.5060834+04	-.1537029-03	-.5073661+04	.9849650+03	.0000000
.7352105-03	-.5073661+04	-.6634401+04	-.9109608+04	.1012414+04	.0000000
.1308499-01	.3686152+03	.1651028+04	.1058273+05	.1545354+04	.0000000
-.2431228-02	.0000000	-.3205398+04	.3090044+04	.0000000	.0000000
-.6857283-03	.0000000	-.3205398+04	.3090044+04	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.2191749-03	-.4451299-03	.0000000	-.4831473-03	-.1642605-03	.0000000
.0000000	-.1058028+05	.0000000	-.1067557+05	.0000000	.0000000
.1029738-02	-.1067557+05	-.8008719+04	-.1496048+05	.0000000	.0000000
.2109351-01	.0000000	.4287956+04	.1319397+05	.0000000	.0000000
-.4758235-02	.0000000	-.1647429+04	.1140523+04	.0000000	.0000000
.0000000	.0000000	-.1647429+04	.1140523+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.1577581-03	-.2683813-03	-.4315602-03	-.2713402-03	-.7542528-04	.0000000
.2230962-02	-.5798812+04	.1583610-03	-.5811806+04	-.1050620+04	.0000000

.7047618-03	-.5811806+04	-.5827931+04	-.9111998+04	-.1078900+04	.0000000
.1162288-01	-.3021093+03	.1798266+04	.7354457+04	-.1592188+04	.0000000
-.2618825-02	.0000000	-.2469984+04	.8876905+02	.0000000	.0000000
.5971267-03	.0000000	-.2469984+04	.8876905+02	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.6507310-04	-.3027705-04	-.2421258-03	.6469731-05	.3428222-04	.0000000
.1298230-02	.4587074+03	.5656536-04	.5356157+03	-.5952129+03	.0000000
.2400613-03	.5356157+03	-.2499593+04	-.1198294+04	-.6053144+03	.0000000
-.7487698-03	-.8937027+02	-.1226095+04	-.2858254+03	-.5687176+03	.0000000
.1910990-03	.0000000	-.2980659+04	-.1102404+04	.0000000	.0000000
.2071532-03	.0000000	-.2980659+04	-.1102404+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.5100146-04	-.5889890-04	.8914056-04	-.4599072-04	-.4162276-05	.0000000
-.3949776-03	-.7592324+03	-.7836439-04	-.7462383+03	.2088569+03	.0000000
.2277103-03	-.7462383+03	-.1909940+04	-.2060865+04	.2228514+03	.0000000
.1547435-02	.1757184+03	-.2723147+02	.1206195+04	.7878887+03	.0000000
-.3295311-03	.0000000	-.1405176+04	-.3872452+03	.0000000	.0000000
-.3041637-03	.0000000	-.1405176+04	-.3872452+03	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.6819767-04	-.1488748-03	-.2050063-08	-.1644521-03	-.6347807-04	.0000000
.9770748-08	-.3453176+04	.1325823-08	-.3511707+04	-.4888388-02	.0000000
.3550815-03	-.3511707+04	-.2467825+04	-.4988603+04	-.5125157-02	.0000000
.6794562-02	-.2858716-02	.1706274+04	.4498934+04	-.1333005-01	.0000000
-.1520656-02	.0000000	-.1415878+03	.4673188+03	.0000000	.0000000
.5108254-08	.0000000	-.1415878+03	.4673188+03	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.5100109-04	-.5889652-04	-.8913805-04	-.4598753-04	-.4160624-05	.0000000
.3949642-03	-.7591596+03	.7836380-04	-.7461635+03	-.2088508+03	.0000000
.2277072-03	-.7461635+03	-.1909928+04	-.2060787+04	-.2228451+03	.0000000
.1547294-02	-.1757175+03	-.2728009+02	.1206106+04	-.7878828+03	.0000000
-.3294990-03	.0000000	-.1405214+04	-.3872696+03	.0000000	.0000000
.3041615-03	.0000000	-.1405214+04	-.3872696+03	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.6507421-04	-.3027923-04	.2421334-03	.6467388-05	.3428148-04	.0000000
-.1298268-02	.4586550+03	-.5656884-04	.5395630+03	.5952314+03	.0000000
.2400663-03	.5355630+03	-.2499633+04	-.1198367+04	.6053336+03	.0000000
-.7986650-03	.8937730+02	-.1226076+04	-.2857614+03	.9687526+03	.0000000
.1910752-03	.0000000	-.2980671+04	-.1102399+04	.0000000	.0000000
-.2071665-03	.0000000	-.2980671+04	-.1102399+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5819801+00	.3334500+02	.1000000-01	.1701700-02	.3094693+02	.3000000+00
-.1577600-03	-.2683867-03	.4315577-03	-.2713467-03	-.7542798-04	.0000000
-.2230948-02	-.5798959+04	-.1583604-03	-.5811956+04	.1050614+04	.0000000
.7047720-03	-.5811956+04	-.5828000+04	-.9112179+04	.1078894+04	.0000000
.1162317-01	.3021084+03	.1798341+04	.7354636+04	.1592182+04	.0000000
-.2618890-02	.0000000	-.2469961+04	.8880059+02	.0000000	.0000000
-.5971246-03	.0000000	-.2469961+04	.8880059+02	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.1847953-03	-.4272706-03	.0000000	-.2654244-03	-.1612995-03	.0000000
.0000000	-.1189522+05	.0000000	-.1198967+05	.0000000	.0000000
.9795053-03	-.1198967+05	-.6749018+04	-.1492328+05	.0000000	.0000000
.1822991-01	.0000000	.4299118+04	.6701077+04	.0000000	.0000000
-.4974439-02	.0000000	-.7048712+03	-.4855384+04	.0000000	.0000000
.0000000	.0000000	-.7048712+03	-.4855384+04	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701708-02	.3142552+02	.3000000+00
-.1348058-03	-.2591472-03	-.4505061-03	-.1508441-03	-.7630803-04	.0000000
.2022311-02	-.6536232+04	.1593939-03	-.6549098+04	-.1097800+04	.0000000
.6639026-03	-.6549098+04	-.4981721+04	-.9110061+04	-.1126265+04	.0000000
.1007213-01	-.2284415+03	.1892033+04	.3759128+04	-.1602573+04	.0000000
-.2740756-02	.0000000	-.1754934+04	-.3249093+04	.0000000	.0000000
.5070728-03	.0000000	-.1754934+04	-.3249093+04	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.5851679-04	-.3213909-04	-.2536367-03	-.7324995-06	.2947175-04	.0000000
-.1180676-02	.4804158+03	.5687575-04	.5566734+03	-.6239347+03	.0000000
.2150259-03	.5566734+03	-.2249817+04	-.1235809+04	-.6340917+03	.0000000
-.6905648-03	-.6599235+02	-.1061689+04	-.7477676+02	-.5718383+03	.0000000
.1927675-03	.0000000	-.2639656+04	-.9420479+03	.0000000	.0000000
-.1753057-03	.0000000	-.2639656+04	-.9420479+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.4501306-04	-.5808381-04	.9180750-04	-.2953187-04	-.5331759-05	.0000000
-.3525732-03	-.8765835+03	-.7895840-04	-.8637171+03	.2154182+03	.0000000
.2088749-03	-.8637171+03	-.1688333+04	-.2073209+04	.2295187+03	.0000000
.1349060-02	.1351832+03	.2567450+02	.7137766+03	.7938609+03	.0000000
-.3513321-03	.0000000	-.1190439+04	-.8565580+03	.0000000	.0000000
-.2591496-03	.0000000	-.1190439+04	-.8565580+03	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.5780868-04	-.1429219-03	-.2124404-08	-.9386148-04	-.6092266-04	.0000000
.8788292-08	-.3891194+04	.1335512-08	-.3949255+04	-.5072511-02	.0000000
.3359955-03	-.3949255+04	-.2091449+04	-.4971594+04	-.5311009-02	.0000000
.5893520-02	-.2190688-02	.1659650+04	.2394259+04	-.1342746-01	.0000000
-.1595253-02	.0000000	.9341934+02	-.1471811+04	.0000000	.0000000
.4348640-08	.0000000	.9341934+02	-.1471811+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.4501280-04	-.5808157-04	-.9180487-04	-.2953019-04	-.5330215-05	.0000000
.3525610-03	-.8765021+03	.7895781-04	-.8636337+03	-.2154117+03	.0000000
.2088717-03	-.8636337+03	-.1688325+04	-.2073132+04	-.2295122+03	.0000000
.1348937-02	-.1351825+03	.2562885+02	.7137311+03	-.7938550+03	.0000000
-.3512986-03	.0000000	-.1190478+04	-.8565430+03	.0000000	.0000000
.2591477-03	.0000000	-.1190478+04	-.8565430+03	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.5851773-04	-.3213618-04	.2536447-03	-.7337608-06	.2947102-04	.0000000
-.1180711-02	.4803569+03	-.5687926-04	.5566143+03	.6239540+03	.0000000
.2150306-03	.5566143+03	-.2249851+04	-.1235883+04	.6341116+03	.0000000
-.6404741-03	.6594770+02	-.1061669+04	-.7474512+02	.5718735+03	.0000000
.1927426-03	.0000000	-.2639662+04	-.9420727+03	.0000000	.0000000
-.1753170-03	.0000000	-.2639662+04	-.9420727+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.5921903+00	.3393000+02	.1000000-01	.1701700-02	.3142552+02	.3000000+00
-.1348074-03	-.2591524-03	.4505034-03	-.1508476-03	-.7631062-04	.0000000
-.2022298-02	-.6636396+04	-.1593934-03	-.6549265+04	.1097794+04	.0000000

.6639124-03	-.6549265+04	-.4981777+04	-.9110241+04	.1126259+04	.0000000
.1007238-01	.2284408+03	.1892106+04	.3759219+04	.1602567+04	.0000000
-.2740825-02	.0000000	-.1754904+04	-.3249143+04	.0000000	.0000000
-.5070709-03	.0000000	-.1754904+04	-.3249143+04	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6024005+00	.3451500+02	.1000000-01	-.1701700-02	.3190082+02	.3000000+00
-.1495936-03	-.4075367-03	.0000000	-.2578970-04	-.1549938-03	.0000000
.0000000	-.1321033+05	.0000000	-.1330179+05	.0000000	.0000000
.9108443-03	-.1330179+05	-.5467208+04	-.1488283+05	.0000000	.0000000
.1532981-01	.0000000	.4211878+04	-.4450741+03	.0000000	.0000000
-.5059186-02	.0000000	.1620066+03	-.1145241+05	.0000000	.0000000
.0000000	.0000000	.1620066+03	-.1145241+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.1112809-03	-.2488026-03	-.4620445-03	-.1809516-04	-.7524786-04	.0000000
.1800249-02	-.7273764+04	-.1566600-03	-.7286207+04	-.1127135+04	.0000000
.6125508-03	-.7286207+04	-.4119193+04	-.9103911+04	-.1155111+04	.0000000
.8472341-02	-.1479282+03	.1928933+04	-.2013091+03	-.1575085+04	.0000000
-.2789898-02	.0000000	-.1080992+04	-.6921224+04	.0000000	.0000000
.4176616-03	.0000000	-.1080992+04	-.6921224+04	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.5173433-04	-.3390780-04	-.2614034-03	-.8353541-05	.2472383-04	.0000000
-.1054915-02	.5020020+03	.5583411-04	.5758643+03	-.6435374+03	.0000000
.1900532-03	.5758643+03	-.1991926+04	-.1268765+04	-.6535084+03	.0000000
-.5323582-03	-.3987162+02	-.8984787+03	.1491136+03	-.5613655+03	.0000000
.1901766-03	.0000000	-.2293745+04	-.7666278+03	.0000000	.0000000
.1437625-03	.0000000	-.2293745+04	-.7666278+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.3878366-04	-.5705666-04	.9236216-04	-.1110596-04	-.6192340-05	.0000000
-.3083660-03	-.9943041+03	-.7769752-04	-.9818616+03	.2170300+03	.0000000
.1884897-03	-.9818616+03	-.1458651+04	-.2083466+04	.2309054+03	.0000000
.1141181-02	.9154009+02	.6998889+02	.1628445+03	.7811839+03	.0000000
-.3631061-03	.0000000	-.9777396+03	-.1378521+04	.0000000	.0000000
-.2143477-03	.0000000	-.9777396+03	-.1378521+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.4706670-04	-.1363649-03	-.2156242-08	-.1590536-04	-.5733340-04	.0000000
.7754281-08	-.4329754+04	.1313779-08	-.4386019+04	-.5155988-02	.0000000
.3111281-03	-.4386019+04	-.1704624+04	-.4954347+04	-.5390605-02	.0000000
.4961890-02	-.1468862-02	.1582899+04	.6991942+02	-.1320895-01	.0000000
-.1627154-02	.0000000	.3080011+03	-.3613788+04	.0000000	.0000000
.3593078-08	.0000000	.3080011+03	-.3613788+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.3878351-04	-.5705457-04	-.9235945-04	-.1110582-04	-.6190924-05	.0000000
.3083550-03	-.9942140+03	.7769694-04	-.9817695+03	-.2170234+03	.0000000
.1884867-03	-.9817695+03	-.1458648+04	-.2083390+04	-.2308986+03	.0000000
.1141078-02	-.9153967+02	.6994679+02	.1628468+03	-.7811780+03	.0000000
-.3630721-03	.0000000	-.9777775+03	-.1378462+04	.0000000	.0000000
.2143462-03	.0000000	-.9777775+03	-.1378462+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6024005+00	-.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.5173509-04	-.3390980-04	.2614115-03	-.8353614-05	.2472311-04	.0000000
-.1054946-02	.5019367+03	-.5583756-04	.5757988+03	.6435572+03	.0000000
.1900576-03	.5757988+03	-.1991953+04	-.1268838+04	.6535288+03	.0000000
-.5322820-03	.3987515+02	-.8984594+03	.1491098+03	.5614002+03	.0000000
.1901514-03	.0000000	-.2293746+04	-.7666855+03	.0000000	.0000000
-.1437718-03	.0000000	-.2293746+04	-.7666855+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6024005+00	.3451500+02	.1000000-01	.1701700-02	.3190082+02	.3000000+00
-.1112821-03	-.2488075-03	.4620418-03	-.1809539-04	-.7525029-04	.0000000
-.1800238-02	-.7273946+04	-.1566594-03	-.7286391+04	.1127128+04	.0000000
.6125601-03	-.7286391+04	-.4119236+04	-.9104089+04	.1155105+04	.0000000
.8472551-02	.1479278+03	.1929002+04	-.2013167+03	.1575079+04	.0000000
-.2789968-02	.0000000	-.1080956+04	-.6921364+04	.0000000	.0000000
-.4176601-03	.0000000	-.1080956+04	-.6921364+04	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.1147142-03	-.3859313-03	.0000000	.2356893-03	-.1453649-03	.0000000
.0000000	-.1452654+05	.0000000	-.1461286+05	.0000000	.0000000
.8243476-03	-.1461286+05	-.4204709+04	-.1484047+05	.0000000	.0000000
.1242258-01	.0000000	.4023456+04	-.8242462+04	.0000000	.0000000
-.4999903-02	.0000000	.9195219+03	-.1864862+05	.0000000	.0000000
.0000000	.0000000	.9195219+03	-.1864862+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.8789427-04	-.2373451-03	-.4664048-03	.1268549-03	-.7220784-04	.0000000
.1568642-02	-.8011920+04	.1500226-03	-.8023645+04	-.1139721+04	.0000000
.5510662-03	-.8023645+04	-.3266225+04	-.9094192+04	-.1166512+04	.0000000
.6867489-02	-.6084446+02	.1905724+04	-.4525293+04	-.1508352+04	.0000000
-.2759222-02	.0000000	-.4705927+03	-.1092600+05	.0000000	.0000000
.3310661-03	.0000000	-.4705927+03	-.1092600+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.4483948-04	-.3558954-04	-.2656440-03	-.1641654-04	.2013071-04	.0000000
.9229265-03	.5234753+03	.5339124+04	.5932109+03	-.6545754+03	.0000000
.1651812-03	.5932109+03	-.1730310+04	-.1296921+04	-.6641101+03	.0000000
-.4266696-03	-.1121673+02	-.7395803+03	.3865666+03	-.5368044+03	.0000000
.1830790-03	.0000000	-.1949105+04	-.5751899+03	.0000000	.0000000
.1132986-03	.0000000	-.1949105+04	-.5751899+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.3246493-04	-.5581259-04	.9092518-04	.9278740-05	-.6717709-05	.0000000
-.2634194-03	-.1112509+04	-.7451492-04	-.1100784+04	.2140059+03	.0000000
.1666119-03	-.1100784+04	-.1226466+04	-.2091624+04	.2273129+03	.0000000
.9299018-03	.4498109+02	.1044657+03	-.4463373+03	.7491855+03	.0000000
-.3637250-03	.0000000	-.7724166+03	-.1952748+04	.0000000	.0000000
-.1708353-03	.0000000	-.7724166+03	-.1952748+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.3632512-04	-.1292037-03	-.2148019-08	.6991005-04	-.5274684-04	.0000000
.6690409-08	-.4769209+04	-.1259490-08	-.4822363+04	-.5145124+02	.0000000
.2806441-03	-.4822363+04	-.1320050+04	-.4937272+04	-.5370046-02	.0000000
.4025489-02	-.6962409-03	-.1476061+04	-.2473898+04	-.1266312-01	.0000000
-.1612128-02	.0000000	.4926515+03	-.5958419+04	.0000000	.0000000
.2859784-08	.0000000	.4926515+03	-.5958414+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.3246489-04	-.5581067-04	-.9092242-04	.9277122-05	-.6716439-05	.0000000
.2634098-03	-.1112410+04	.7451437-04	-.1100683+04	-.2139991+03	.0000000

.1666090-03	-.1100683+04	-.1226466+04	-.2091549+04	-.2273060+03	.0000000
.9298183-03	-.4498097+02	.1044276+03	-.4462829+03	-.7491799+03	.0000000
-.3636913-03	.0000000	-.7724534+03	-.1952639+04	.0000000	.0000000
.1708342-03	.0000000	-.7724534+03	-.1952639+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.4484006-04	-.3559143-04	.2656522-03	-.1641532-04	.2013002-04	.0000000
-.9229535-03	.5234035+03	-.5339454-04	.5931389+03	.6545953+03	.0000000
.1651852-03	.5931389+03	-.1730331+04	-.1296993+04	.6641306+03	.0000000
-.4266078-03	-.1121828+02	-.7395616+03	.3865242+03	.5368376+03	.0000000
.1830541-03	.0000000	-.1949102+04	-.5752832+03	.0000000	.0000000
-.1133060-03	.0000000	-.1949102+04	-.5752832+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6126106+00	.3510000+02	.1000000-01	.1701700-02	.3237280+02	.3000000+00
-.8789512-04	-.2373497-03	.4666020-03	.1268582-03	-.7221007-04	.0000000
-.1568632-02	-.8012120+04	-.1500220-03	-.8023848+04	.1139714+04	.0000000
.5510747-03	-.8023848+04	-.3266255+04	-.9094370+04	.1166505+04	.0000000
.6867659-02	.6084434+02	.1905788+04	-.4525407+04	.1508346+04	.0000000
-.2759291-02	.0000000	-.4705515+03	-.1092624+05	.0000000	.0000000
-.3310649-03	.0000000	-.4705515+03	-.1092624+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.8143638-04	-.3624650-03	.0000000	.5189695-03	-.1324474-03	.0000000
.0000000	-.1584424+05	.0000000	-.1592328+05	.0000000	.0000000
.7219515-03	-.1592328+05	-.3007808+04	-.1479806+05	.0000000	.0000000
.9594801-02	.0000000	.3731052+04	-.1668982+05	.0000000	.0000000
-.4784044-02	.0000000	.1530330+04	-.2644303+05	.0000000	.0000000
.0000000	.0000000	.1530330+04	-.2644303+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.6542332-04	-.2247782-03	-.4648249-03	.2839686-03	-.6715941-04	.0000000
.1331133-02	-.8758904+04	.1393498-03	-.8761620+04	-.1137177+04	.0000000
.4802777-03	-.8761620+04	-.2451090+04	-.9081894+04	-.1162062+04	.0000000
.5305565-02	.3257145+02	.1819214+04	-.9211718+04	-.1401046+04	.0000000
-.2641726-02	.0000000	.5208272+02	-.1526240+05	.0000000	.0000000
.2495377-03	.0000000	.5208272+02	-.1526240+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.3792598-04	-.3717411-04	-.2666632-03	-.2494386-04	.1578287-04	.0000000
.7865830-03	.5448716+03	.4949968-04	.6087622+03	-.6578184+03	.0000000
.1404253-03	.6087622+03	-.1468633+04	-.1320137+04	-.6666581+03	.0000000
-.3261699-03	.1997270+02	-.5879949+03	.6382686+03	-.4976780+03	.0000000
.1712141-03	.0000000	-.1611265+04	-.3669077+03	.0000000	.0000000
.8471721-04	.0000000	-.1611265+04	-.3669077+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.2621351-04	-.5434886-04	.8770398-04	.3161705-04	-.6883328-05	.0000000
-.2187305-03	-.1231251+04	-.6934569-04	-.1220536+04	.2068761+03	.0000000
.1433662-03	-.1220536+04	-.9975259+03	-.2097764+04	.2192599+03	.0000000
.7219730-03	-.4325640+01	.1278972+03	-.1113606+04	.6972131+03	.0000000
-.3520643-03	.0000000	-.5799055+03	-.2578977+04	.0000000	.0000000
-.1297277-03	.0000000	-.5799055+03	-.2578977+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.2598528-04	-.1214398-03	-.2103714-08	.1620874-03	-.4720319-04	.0000000
.5617053-08	-.5209748+04	.1171544-08	-.5258485+04	-.5050069-02	.0000000
.2449839-03	-.5258485+04	-.9521567+03	-.4920936+04	-.5259286-02	.0000000
.3112565-02	.1295480-03	.1339141+04	-.5237276+04	-.1177890-01	.0000000
-.1545945-02	.0000000	.6365371+03	-.8505815+04	.0000000	.0000000
.2167623-08	.0000000	.6365371+03	-.8505815+04	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.2621357-04	-.5434711-04	-.8770121-04	.3161353-04	-.6882220-05	.0000000
.2187224-03	-.1231143+04	.6934517-04	-.1220427+04	-.2068692+03	.0000000
.1433636-03	-.1220427+04	-.9975290+03	-.2097690+04	-.2192830+03	.0000000
.7219085-03	.4325493+01	.1278638+03	-.1113495+04	-.6972079+03	.0000000
-.3520321-03	.0000000	-.5799404+03	-.2578819+04	.0000000	.0000000
.1297268-03	.0000000	-.5799404+03	-.2578819+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6228208+00	.3568501+02	.1000000-01	.1701700-02	.3284140+02	.3000000+00
-.3792639-04	-.3717588-04	.2666714-03	.2494123-04	.1578224-04	.0000000
-.7866058-03	.5447934+03	-.4950275-04	.6086838+03	.6578381+03	.0000000
.1404288-03	.6086838+03	-.1468648+04	-.1320210+04	.6666784+03	.0000000
-.3261173-03	-.1997324+02	-.5879773+03	.6381843+03	.4977089+03	.0000000
.1711902-03	.0000000	-.1611259+04	-.3670396+03	.0000000	.0000000
-.8472279-04	.0000000	-.1611259+04	-.3670396+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6228208+00	.3568501+02	.1000000-01	-.1701700-02	.3284140+02	.3000000+00
-.6542384-04	-.2247825-03	.4648222-03	.2839758-03	-.6716140-04	.0000000
-.1331125-02	-.8751122+04	-.1393492-03	-.8761839+04	.1137170+04	.0000000
.4802852-03	-.8761839+04	-.2451108+04	-.9082071+04	.1162055+04	.0000000
.5305697-02	-.3257124+02	.1819272+04	-.9211940+04	.1401041+04	.0000000
-.2641792-02	.0000000	.5212690+02	-.1526275+05	.0000000	.0000000
-.2495368-03	.0000000	.5212690+02	-.1526275+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.5117922-04	-.3371563-03	.0000000	.8240212-03	-.1162877-03	.0000000
.0000000	-.1716327+05	.0000000	-.1723293+05	.0000000	.0000000
.6045045-03	-.1723293+05	-.1927829+04	-.1475795+05	.0000000	.0000000
.6940231-02	.0000000	.3331808+04	-.2578632+05	.0000000	.0000000
-.4399088-02	.0000000	.1953254+04	-.3483533+05	.0000000	.0000000
.0000000	.0000000	.1953254+04	-.3483533+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.4471270-04	-.2111119-03	-.4575712-03	.4532162-03	-.6008168-04	.0000000
.1091023-02	-.9490587+04	.1245127-03	-.9500003+04	-.1121692+04	.0000000
.4015209-03	-.9500003+04	-.1704480+04	-.9068347+04	-.1143928+04	.0000000
.3838573-02	.1321137+03	.1666243+04	-.1425969+05	-.1251871+04	.0000000
-.2430427-02	.0000000	.4610694+03	-.1992984+05	.0000000	.0000000
.1754049-03	.0000000	.4610694+03	-.1992984+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.3106372-04	-.3865975-04	-.2648557-03	-.3395769-04	.1176921-04	.0000000
.6475961-03	.5662482+03	.4411329-04	.6225883+03	-.6542614+03	.0000000
.1157747-03	.6225883+03	-.1209692+04	-.1338373+04	-.6621393+03	.0000000
-.2336638-03	.5365463+02	-.4466046+03	.9048914+03	-.4435224+03	.0000000
.1543086-03	.0000000	-.1284988+04	-.1410618+03	.0000000	.0000000
.5884940-04	.0000000	-.1284988+04	-.1410618+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.2019029-04	-.5266482-04	.8300654-04	.5590560-04	-.6666275-05	.0000000
-.1751795-03	-.1350523+04	-.6212620-04	-.1341108+04	.1964217+03	.0000000

.1189504+03	-.1341108+04	-.7777300+03	-.2102055+04	.2075164+03	.0000000
.5247887-03	-.5623375+02	.1391117+03	-.1838858+04	.6246271+03	.0000000
-.3270022-03	.0000000	-.4057203+03	-.3257113+04	.0000000	.0000000
-.9217800-04	.0000000	-.4057203+03	-.3257113+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.1649933-04	-.1130767-03	-.2029066-08	.2621343-03	-.4074609-04	.0000000
.4552386-08	-.5651377+04	.1048866-08	-.5694401+04	-.4885356-02	.0000000
.2048873-03	-.5694401+04	-.6172082+03	-.4906057+04	-.5072665-02	.0000000
.2253791-02	.9912228-03	.1172094+04	-.8220455+04	-.1054547-01	.0000000
-.1424370-02	.0000000	.7274030+03	-.1125633+05	.0000000	.0000000
.1536100-08	.0000000	.7274030+03	-.1125633+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.2019042-04	-.5266325-04	-.8300376-04	.5590004-04	-.6665341-05	.0000000
.1781727-03	-.1350407+04	.6212574+04	-.1340990+04	-.1964150+03	.0000000
.1189483-03	-.1340990+04	-.7777359+03	-.2101981+04	-.2075095+03	.0000000
.5247421-03	.5623319+02	.1390833+03	-.1838686+04	-.6246225+03	.0000000
-.3269726-03	.0000000	-.4057525+03	-.3256899+04	.0000000	.0000000
.9217738-04	.0000000	-.4057525+03	-.3256899+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.3106398-04	-.3866140-04	.2648637-03	-.3395356-04	.1176866-04	.0000000
-.6476147-03	.5661638+03	-.4411604-04	.6225035+03	-.6542808+03	.0000000
.1157776-03	.6225035+03	-.1209702+04	-.1338445+04	.6621592+03	.0000000
-.2336294-03	-.5365740+02	-.4465887+03	.9047622+03	.4435500+03	.0000000
.1542867-03	.0000000	-.1284979+04	-.1412351+03	.0000000	.0000000
-.5885334-04	.0000000	-.1284979+04	-.1412351+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6330310+00	.3627001+02	.1000000-01	.1701700-02	.3330658+02	.3000000+00
-.4471292-04	-.2111158-03	.4575685-03	.4532275-03	-.6008339-04	.0000000
-.1091017-02	-.9498823+04	-.1245122-03	-.9500241+04	.1121686+04	.0000000
.4015272-03	-.9500241+04	-.1704488+04	-.9068523+04	.1143921+04	.0000000
.3838668-02	-.1321131+03	.1666294+04	-.1426005+05	.1251866+04	.0000000
-.2430488-02	.0000000	.4611143+03	-.1993030+05	.0000000	.0000000
-.1754042-03	.0000000	.4611143+03	-.1993030+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.2550656-04	-.3100326-03	.0000000	.1150816-02	-.9694370-04	.0000000
.0000000	-.1848286+05	.0000000	-.1854103+05	.0000000	.0000000
.4768358-03	-.1854103+05	-.1021323+04	-.1472301+05	.0000000	.0000000
.4559798-02	.0000000	.2822771+04	-.3553119+05	.0000000	.0000000
-.3832527-02	.0000000	.2143114+04	-.4382546+05	.0000000	.0000000
.0000000	.0000000	.2143114+04	-.4382546+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.2667479-04	-.1963631-03	-.4459580-03	.6345681-03	-.5096095-04	.0000000
.8511380-03	-.1023049+05	.1053846-03	-.1023832+05	-.1096075+04	.0000000
.3166749-03	-.1023832+05	-.1059532+04	-.9055209+04	-.1114895+04	.0000000
.2522510-02	.2376052+03	.1443662+04	-.1966841+05	-.1059554+04	.0000000
-.2118358-02	.0000000	.7285850+03	-.2492794+05	.0000000	.0000000
.1110728-03	.0000000	.7285850+03	-.2492794+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.2429458-04	-.4004814-04	-.2607104-03	-.4348064-04	.8177236-05	.0000000
.5074646-03	.5876764+03	.3718691-04	.6347724+03	-.6451350+03	.0000000
.9118918-04	.6347724+03	-.9552704+03	-.1351671+04	-.6517759+03	.0000000
-.1521462-03	.8979324+02	-.3181657+03	.1107108+04	-.3738834+03	.0000000
.1320764-03	.0000000	-.9741545+03	.1029750+03	.0000000	.0000000
.3655409-04	.0000000	-.9741545+03	.1029750+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.1455972-04	-.5076196-04	.7725579-04	.8214149-04	-.6045111-05	.0000000
-.1334709-03	-.1470254+04	-.5279362-04	-.1462426+04	-.1837115+03	.0000000
.9364125-04	-.1462426+04	-.5731070+03	-.2104745+04	.1931395+03	.0000000
.3463854-03	-.1186168+03	.1369712+03	-.2622010+04	.5307959+03	.0000000
-.2874183-03	.0000000	-.2554383+03	-.3987103+04	.0000000	.0000000
-.5937676-04	.0000000	-.2554383+03	-.3987103+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.8373377-05	-.1041202-03	-.1931788-08	.3695598-03	-.3342246-04	.0000000
.3511349-08	-.6093905+04	.8903922-09	-.6129929+04	-.4670462-02	.0000000
.1614169-03	-.6129929+04	-.3334178+03	-.4893504+04	-.4829470-02	.0000000
.1482266-02	.1901813-02	.9748122+03	-.1142372+05	-.8952151-02	.0000000
-.1243164-02	.0000000	.7514725+03	-.1421048+05	.0000000	.0000000
.9853564-09	.0000000	.7514725+03	-.1421048+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.1455992-04	-.5076058-04	-.7725308-04	.8213374-04	-.6044364-05	.0000000
.1334657-03	-.1470130+04	.5279324-04	-.1462300+04	-.1837048+03	.0000000
.9363954-04	-.1462300+04	-.5731146+03	-.2104672+04	-.1931327+03	.0000000
.3463548-03	.1106158+03	.1369482+03	-.2621773+04	-.5307920+03	.0000000
-.2873925-03	.0000000	-.2554666+03	-.3986830+04	.0000000	.0000000
.5937638-04	.0000000	-.2554666+03	-.3986830+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.2429471-04	-.4004966-04	.2607181-03	-.4347490-04	.8176769-05	.0000000
-.5074790-03	.5875853+03	-.3718924-04	.6346811+03	.6451538+03	.0000000
.9119150-04	.6346811+03	-.9552755+03	-.1351744+04	.6517952+03	.0000000
-.1521235-03	-.8979837+02	-.3181521+03	.1186931+04	.3739068+03	.0000000
.1320574-03	.0000000	-.9741442+03	.1027573+03	.0000000	.0000000
-.3655660-04	.0000000	-.9741442+03	.1027573+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6432412+00	.3685501+02	.1000000-01	.1701700-02	.3376829+02	.3000000+00
-.2667477-04	-.1963666-03	.4459553-03	.6345840-03	-.5096236-04	.0000000
-.8511327-03	-.1023079+05	-.1053842-03	-.1023857+05	.1096068+04	.0000000
.3166798-03	-.1023857+05	-.1059532+04	-.9055384+04	.1114888+04	.0000000
.2522572-02	-.2376042+03	.1443704+04	-.1966890+05	.1059550+04	.0000000
-.2118411-02	.0000000	.7286278+03	-.2492852+05	.0000000	.0000000
-.1110725-03	.0000000	.7286278+03	-.2492852+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.6132520-05	-.2811307-03	.0000000	.1499314-02	-.7448419-04	.0000000
.0000000	-.1980158+05	.0000000	-.1984618+05	.0000000	.0000000
.3428234-03	-.1984618+05	-.3502646+03	-.1469659+05	.0000000	.0000000
.2561571-02	.0000000	.2200868+04	-.4592332+05	.0000000	.0000000
-.3071873-02	.0000000	.2050550+04	-.5341334+05	.0000000	.0000000
.0000000	.0000000	.2050550+04	-.5341334+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.1229044-04	-.1805554-03	-.4313686-03	.8279882-03	-.3979039-04	.0000000
.6136779-03	-.1096975+05	.8184024-04	-.1097571+05	-.1063806+04	.0000000

.2281993-03	-.1097571+05	-.5518514+03	-.9044463+04	-.1078421+04	.0000000
.1417349-02	.3488934+03	.1148322+04	-.2543684+05	-.8228354+03	.0000000
-.1698572-02	.0000000	.8249985+03	-.3025631+05	.0000000	.0000000
.5902410-04	.0000000	.8249985+03	-.3025631+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.1762787-04	-.4134443-04	-.2548143-03	-.5353606-04	.5093274-05	.0000000
.3674188-03	.6092323+03	.2867611-04	.6454010+03	-.6319148+03	.0000000
.6659530-04	.6454010+03	-.7059705+03	-.1360162+04	-.6370358+03	.0000000
-.8475970-04	-.1283575+03	-.2053017+03	.1485604+04	-.2883144+03	.0000000
.1042183-03	.0000000	-.6816342+03	.3657487+03	.0000000	.0000000
.1871796-04	.0000000	-.6816342+03	.3657487+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.9489191-05	-.4864391-04	.7100477-04	.1103209-03	-.4999787-05	.0000000
-.9406656-04	-.1590308+04	-.4128553-04	-.1584352+04	.1701391+03	.0000000
.6779896-04	-.1584352+04	-.3897887+03	-.2106166+04	.1775119+03	.0000000
.1954395-03	-.1673661+03	.1203706+03	-.3462962+04	.4150916+03	.0000000
-.2321943-03	.0000000	-.1346821+03	-.4768945+04	.0000000	.0000000
-.3255248-04	.0000000	-.1346821+03	-.4768945+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.2171109-05	-.9457839-04	-.1821811-08	.4843702-03	-.2528237-04	.0000000
.2504488-08	-.6536925+04	.6950685-09	-.6564670+04	-.4430400-02	.0000000
.1159817-03	-.6564670+04	-.1210786+03	-.4884291+04	-.4554526-02	.0000000
.8335147-03	.2854625-02	.7471105+03	-.1484730+05	-.6988335-02	.0000000
-.9980833-03	.0000000	.6933379+03	-.1736846+05	.0000000	.0000000
.5361771-09	.0000000	.6933379+03	-.1736846+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.9489410-05	-.4864273-04	-.7100213-04	.1103108-03	-.4999235-05	.0000000
.9406274-04	-.1590175+04	.4128523-04	-.1584218+04	-.1701326+03	.0000000
.6779774-04	-.1584218+04	-.3897968+03	-.2106093+04	-.1775053+03	.0000000
.1954223-03	.1673648+03	.1203535+03	-.3462655+04	-.4150886+03	.0000000
-.2321736-03	.0000000	-.1347052+03	-.4768607+04	.0000000	.0000000
.3255228-04	.0000000	-.1347052+03	-.4768607+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6534614+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.1762790-04	-.4134580-04	.2548217-03	-.5352859-04	.5092912-05	.0000000
-.3674292-03	.6091348+03	-.2867792-04	.6453033+03	.6319329+03	.0000000
.6659697-04	.6453033+03	-.7059722+03	-.1360234+04	.6370543+03	.0000000
-.8474700-04	-.1283651+03	-.2052910+03	.1485376+04	.2883326+03	.0000000
.1042030-03	.0000000	-.6816242+03	.3654836+03	.0000000	.0000000
-.1871931-04	.0000000	-.6816242+03	.3654836+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6534514+00	.3744001+02	.1000000-01	.1701700-02	.3422648+02	.3000000+00
-.1229026-04	-.1805586-03	.4313659-03	.8280089-03	-.3979145-04	.0000000
-.6136740-03	-.1097003+05	-.8183994-04	-.1097598+05	.1063800+04	.0000000
.2282029-03	-.1097598+05	-.5518457+03	-.9044637+04	.1078415+04	.0000000
.1417384-02	-.3488921+03	-.1148354+04	-.2543747+05	.8228324+03	.0000000
-.1698614-02	.0000000	.8250358+03	-.3025702+05	.0000000	.0000000
-.5902391-04	.0000000	.8250358+03	-.3025702+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
.5072770-05	-.2504968-03	.0000000	.1869451-02	-.4898865-04	.0000000
.0000000	-.2111731+05	.0000000	-.2114625+05	.0000000	.0000000
.2079610-03	-.2114625+05	.1773283+02	-.1468252+05	.0000000	.0000000
.1060743-02	.0000000	-.1462879+04	-.5696094+05	.0000000	.0000000
-.2104666-02	.0000000	.1621843+04	-.6359844+05	.0000000	.0000000
.0000000	.0000000	.1621843+04	-.6359844+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
-.2609600-05	-.1637204-03	-.4154775-03	.1033426-02	-.2656975-04	.0000000
.3800625-03	-.1170713+05	.5375528-04	-.1171093+05	-.1029094+04	.0000000
.1391706-03	-.1171093+05	-.2195392+03	-.9038402+04	-.1038694+04	.0000000
.5870241-03	.4658468+03	.7770683+03	-.3156354+05	-.5404646+03	.0000000
-.1164144-02	.0000000	.7188044+03	-.3591438+05	.0000000	.0000000
.2181885-04	.0000000	.7188044+03	-.3591438+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
-.1103551-04	-.4255728-04	-.2478571-03	-.6414817-04	.2602697-05	.0000000
-.2283621-03	.6309859+03	.1853704-04	.6545535+03	-.6163323+03	.0000000
.4188259-04	.6545535+03	-.4610421+03	-.1364051+04	-.6196426+03	.0000000
-.3482712-04	.1693199+03	-.1104950+03	.1801081+04	-.1863745+03	.0000000
.7042106-04	.0000000	-.4091463+03	.6477267+03	.0000000	.0000000
.6255593-05	.0000000	-.4091463+03	.6477267+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
-.5148290-05	-.4631646-04	.6495282-04	.1404380-03	-.3511554-05	.0000000
-.5710803-04	-.1710484+04	-.2753957-04	-.1706684+04	.1574640+03	.0000000
.4187304-04	-.1706684+04	-.2339864+03	-.2106721+04	.1623821+03	.0000000
.8126541-04	-.2263892+03	.8823776+02	-.4361550+04	.2768875+03	.0000000
-.1602145-03	.0000000	-.4910206+02	-.5602633+04	.0000000	.0000000
-.1297194-04	.0000000	-.4910206+02	-.5602633+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
.1482379-05	-.8446163-04	-.1711528-08	.6065647-03	-.1637914-04	.0000000
.1536640-08	-.6979796+04	.4618437-09	-.6997989+04	-.4196343-02	.0000000
.7036066-04	-.6997989+04	-.2703409+01	-.4879575+04	-.4278820-02	.0000000
.3454859-03	.3848213-02	-.4887163+03	-.1849117+05	-.4643454-02	.0000000
-.6848834-03	.0000000	.5358454+03	-.2073079+05	.0000000	.0000000
.2099947-09	.0000000	-.5358454+03	-.2073079+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6636616+00	.3802501+02	.1000000-01	.1701700-02	.3468110+02	.3000000+00
-.5148481-05	-.4631549-04	-.6495025-04	.1404254-03	-.3511206-05	.0000000
.5710566-04	-.1710342+04	.2753938-04	-.1706541+04	-.1574576+03	.0000000
.4187233-04	-.1706541+04	-.2339932+03	-.2106648+04	-.1623756+03	.0000000
.8125829-04	.2263874+03	.8822686+02	-.4361169+04	-.2768855+03	.0000000
-.1602003-03	.0000000	-.4911828+02	-.5602227+04	.0000000	.0000000
.1297188-04	.0000000	-.4911828+02	-.5602227+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6636616+00	.3802501+02	.1000000+01	.1701700-02	.3468110+02	.3000000+00
-.1103549-04	-.4255850-04	.2478641-03	-.6413889-04	.2602457-05	.0000000
-.2283685-03	.6308819+03	-.1853824-04	.6544495+03	.6163497+03	.0000000
.4188360-04	.6544495+03	-.4610419+03	-.1364123+04	.6196603+03	.0000000
-.3482186-04	-.1693301+03	-.1104878+03	.1800799+04	.1863865+03	.0000000
.7041061-04	.0000000	-.4091384+03	.6474117+03	.0000000	.0000000
-.6256185-05	.0000000	-.4091384+03	.6474117+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6636616+00	.3802501+02	.1000000+01	.1701700-02	.3468110+02	.3000000+00
-.2609371-05	-.1637231-03	.4154749-03	.1033451-02	-.2657043-04	.0000000
-.3800601-03	-.1170742+05	-.5375509-04	-.1171122+05	.1029088+04	.0000000

.1391728-03	-.1171122+05	.2195323+03	-.9038577+04	.1038687+04	.0000000
.5870386-03	-.4658451+03	.7770893+03	-.3156432+05	.5404626+03	.0000000
-.1164172-02	.0000000	.7188319+03	-.3591523+05	.0000000	.0000000
-.2181878-04	.0000000	.7188319+03	-.3591523+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
.6077079-05	-.2181882-03	.0000000	.2261124-02	-.2054733-04	.0000000
.0000000	-.2242715+05	.0000000	-.2243837+05	.0000000	.0000000
.7892504-04	-.2243837+05	.9200892+01	-.1468518+05	.0000000	.0000000
.1795925-03	.0000000	.6054228+03	-.6864110+05	.0000000	.0000000
-.9184966-03	.0000000	.7987321+03	-.7437936+05	.0000000	.0000000
.0000000	.0000000	.7987321+03	-.7437936+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
.1248028-05	-.1458970-03	-.4002732-03	.1250807-02	-.1130533-04	.0000000
.1907598-03	-.1244093+05	.2100601-04	-.1244229+05	-.9969317+03	.0000000
.5331776-04	-.1244229+05	-.1032143+03	-.9039627+04	-.1000683+04	.0000000
.9940378-04	.5883506+03	.3267314+03	-.3804643+05	-.2111979+03	.0000000
-.5081861-03	.0000000	.3766007+03	-.4190111+05	.0000000	.0000000
.2096243-05	.0000000	.3766007+03	-.4190111+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
-.4446848-05	-.4369888-04	-.2406346-03	-.7534208-04	.7901355-06	.0000000
.9081034-04	.6529883+03	.6726388-05	.6622891+03	-.6003852+03	.0000000
.1689972-04	.6622891+03	-.2181922+03	-.1363617+04	-.6015864+03	.0000000
-.5853762-05	.2126547+03	-.3607785+02	.2134257+04	-.6762822+02	.0000000
.3035765-04	.0000000	-.1571095+03	.9492963+03	.0000000	.0000000
.1097124-06	.0000000	-.1571095+03	.9492963+03	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
-.1708125-05	-.4378761-04	.5996276-04	.1724831-03	-.1562917-05	.0000000
-.2232994-04	-.1830513+04	-.1149331-04	-.1829152+04	.1478644+03	.0000000
.1640739-04	-.1829152+04	-.1119653+03	-.2106885+04	.1499069+03	.0000000
.1381286-04	-.2876075+03	.3953326+02	-.5317513+04	.1155557+03	.0000000
-.7036769-04	.0000000	-.4356227+01	-.6488121+04	.0000000	.0000000
-.1941066-05	.0000000	-.4356227+01	-.6488121+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
.1896368-05	-.7378283-04	-.1616066-08	.7361305-03	-.6769351-05	.0000000
.6054723-09	-.7421620+04	.1896668-09	-.7428995+04	-.4006295-02	.0000000
.2672563-04	-.7428995+04	-.3177157+01	-.4880649+04	-.4040166-02	.0000000
.5854757-04	.4881344-02	.1992595+03	-.2235501+05	-.1906941-02	.0000000
-.2993224-03	.0000000	.2599716+03	-.2429740+05	.0000000	.0000000
.2890381-10	.0000000	.2599716+03	-.2429740+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
-.1708227-05	-.4378686-04	-.5996026-04	.1724679-03	-.1562777-05	.0000000
.2232900-04	-.1830362+04	.1149324-04	-.1829001+04	-.1478482+03	.0000000
.1640714-04	-.1829001+04	-.1119685+03	-.2106813+04	-.1499006+03	.0000000
.1381165-04	.2876053+03	.3952893+02	-.5317054+04	-.1155550+03	.0000000
-.7036152-04	.0000000	-.4363509+01	-.6487642+04	.0000000	.0000000
.1941064-05	.0000000	-.4363509+01	-.6487642+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
-.4446818-05	-.4369994-04	.2406413-03	-.7533087-04	.7900341-06	.0000000
-.9081289-04	.6528780+03	-.6726866-05	.6621786+03	.6004021+03	.0000000
.1690011-04	.6621786+03	-.2181922+03	-.1363689+04	.6016034+03	.0000000
-.5852871-05	-.2126676+03	-.3607486+02	.2133916+04	.6763303+02	.0000000
.3035309-04	.0000000	-.1571055+03	.9489279+03	.0000000	.0000000
-.1097718-06	.0000000	-.1571055+03	.9489279+03	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6738718+00	.3861001+02	.1000000-01	.1701700-02	.3513211+02	.3000000+00
.1248174-05	-.1458993-03	.4002707-03	.1250838-02	-.1130561-04	.0000000
-.1507549-03	-.1244123+05	-.2100594-04	-.1244260+05	.9969255+03	.0000000
.5331856-04	-.1244260+05	-.1032110+03	-.9039802+04	.1000677+04	.0000000
.9940625-04	-.5883484+03	.3267399+03	-.3804737+05	.2111972+03	.0000000
-.5081987-03	.0000000	.3766135+03	-.4190211+05	.0000000	.0000000
-.2096242-05	.0000000	.3766135+03	-.4190211+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
.2072935-05	-.2014266-03	.0000000	.2464990-02	-.5253193-05	.0000000
.0000000	-.2307873+05	.0000000	-.2308033+05	.0000000	.0000000
.1901800-04	-.2308033+05	-.1608797+03	-.1469409+05	.0000000	.0000000
.1153515-04	.0000000	.1307902+03	-.7472080+05	.0000000	.0000000
-.2394413-03	.0000000	.2197839+03	-.7999249+05	.0000000	.0000000
.0000000	.0000000	.2197839+03	-.7999249+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
.6240395-06	-.1366292-03	-.3936419-03	.1363945-02	-.2910455-05	.0000000
.3755620-04	-.1280584+05	-.2843756-05	-.1280588+05	-.9835969+03	.0000000
.1293476-04	-.1280588+05	-.1394337+03	-.9043869+04	-.9841048+03	.0000000
.6385456-05	.6516517+03	.7091276+02	-.4142055+05	-.2859160+02	.0000000
-.1324946-03	.0000000	.1060348+03	-.4501722+05	.0000000	.0000000
-.3624342-06	.0000000	.1060348+03	-.4501722+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
-.1118790-05	-.4424776-04	-.2372028-03	-.8116521-04	.1644067-06	.0000000
.2263842-04	.6640902+03	.1808268-06	.6656348+03	-.5929747+03	.0000000
.4247556-05	.6656348+03	-.9635905+02	-.1361884+04	-.5930070+03	.0000000
-.3740861-06	.2352039+03	-.7200589+01	.2307707+04	-.1818063+01	.0000000
.7869882-05	.0000000	-.3849589+02	.1107524+04	.0000000	.0000000
-.2921789-06	.0000000	-.3849589+02	.1107524+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
-.3795244-06	-.4245075-04	.5818475-04	.1892244-03	-.4108107-06	.0000000
-.5540474-05	-.1890371+04	-.2588000-05	-.1890339+04	.1449997+03	.0000000
.4044218-05	-.1890334+04	-.6558877+02	-.2106988+04	.1454619+03	.0000000
.8890563-06	-.3190187+03	.8651150+01	-.5816892+04	.2602019+02	.0000000
-.1839866-04	.0000000	.9385897+00	-.6950256+04	.0000000	.0000000
-.5077000-07	.0000000	.9385897+00	-.6950256+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
.6536584-06	-.6823741-04	-.1579436-08	.8036693-03	-.1718131-05	.0000000
.1505541-09	-.7641783+04	.3864243-10	-.7643276+04	-.3941690-02	.0000000
.6444806-05	-.7643276+04	-.5644725+02	-.4883797+04	-.3948591-02	.0000000
.3761999-05	.5412402-02	.4273820+02	-.2436918+05	-.3885174-03	.0000000
-.7808391-04	.0000000	.7115367+02	-.2615720+05	.0000000	.0000000
-.1433765-12	.0000000	.7115367+02	-.2615720+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701708-02	.3535624+02	.3000000+00
-.3795535-06	-.4245011-04	-.5818229-04	.1892079-03	-.4107755-06	.0000000
.5540239-05	-.1890215+04	.2587998-05	-.1890179+04	-.1449935+03	.0000000

.4044158-05	-.1890179+04	-.6558913+02	-.2106915+04	-.1454557+03	.0000000
.8889789-06	.3190162+03	.8650228+01	-.5816392+04	-.2602017+02	.0000000
-.1839705-04	.0000000	.9366597+00	-.6949740+04	.0000000	.0000000
.5077303-07	.0000000	.9366597+00	-.6949740+04	.0000000	.0000000

THETA ANGLE= 4.71240 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
-.1118779-05	-.4424874-04	.2372095-03	-.8115300-04	.1643807-06	.0000000
-.2263905-04	.6639767+03	-.1809068-06	.6655213+03	.5929913+03	.0000000
.4247648-05	.6655213+03	-.9635981+02	-.1361956+04	.5930236+03	.0000000
-.3740290-06	-.2352182+03	-.7199941+01	.2307336+04	.1818867+01	.0000000
.7868695-05	.0000000	-.3849480+02	.1107128+04	.0000000	.0000000
.2921834-06	.0000000	-.3849480+02	.1107128+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6789769+00	.3890251+02	.1000000-01	.1701700-02	.3535624+02	.3000000+00
.6240833-06	-.1366313-03	.3936394-03	.1363979-02	-.2910527-05	.0000000
-.3755596-04	-.1280616+05	-.2843754-05	-.1280620+05	.9835908+03	.0000000
.1293495-04	-.1280620+05	-.1394345+03	-.9044039+04	.9840986+03	.0000000
.6385614-05	-.6516492+03	.7091459+02	-.4142157+05	.2859158+02	.0000000
-.1324979-03	.0000000	.1060383+03	-.4501830+05	.0000000	.0000000
.3624311-06	.0000000	.1060383+03	-.4501830+05	.0000000	.0000000

THETA ANGLE= .00000 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
.7232493-10	-.1957523-03	.0000000	.2534121-02	-.1500752-10	.0000000
.0000000	-.2329528+05	.0000000	-.2329355+05	.0000000	.0000000
.3095793-09	-.2329355+05	-.2446878+03	-.1469839+05	.0000000	.0000000
-.2517443-08	.0000000	-.3431555+02	-.7678247+05	.0000000	.0000000
-.9124520-09	.0000000	.2621473-02	-.8189620+05	.0000000	.0000000
.0000000	.0000000	.2621473-02	-.8189620+05	.0000000	.0000000

THETA ANGLE= .78540 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
.2638366-10	-.1334892-03	-.3916533-03	.1402308-02	-.8936798-11	.0000000
.4124982-09	-.1292710+05	-.3478244-05	-.1292668+05	-.9797543+03	.0000000
.1803501-09	-.1292668+05	-.1668605+03	-.9045907+04	-.9791332+03	.0000000
-.1030584-08	.6730503+03	-.1898924+02	-.4256467+05	.3497085+02	.0000000
-.4299343-09	.0000000	.1059614-02	-.4607393+05	.0000000	.0000000
-.9381180-10	.0000000	.1059614-02	-.4607393+05	.0000000	.0000000

THETA ANGLE= 1.57080 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
-.2901096-10	-.4442800-04	-.2361155-03	-.8314034-04	-.2052407-12	.0000000
.2065709-09	.6678051+03	-.2096932-05	.6666725+03	-.5906632+03	.0000000
-.1723083-10	.6666725+03	-.5553605+02	-.1361094+04	-.5902887+03	.0000000
.7653179-09	.2428493+03	.1125778+01	.2366555+04	.2108290+02	.0000000
.1870714-09	.0000000	-.8641715-03	.1161370+04	.0000000	.0000000
-.2472696-10	.0000000	-.8641715-03	.1161370+04	.0000000	.0000000

THETA ANGLE= 2.35620 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
-.5721731-11	-.4199481-04	.5773383-04	.1949102-03	.1479101-12	.0000000
-.1203607-09	-.1910286+04	.5127197-06	-.1910707+04	.1444261+03	.0000000
-.5301776-10	-.1910707+04	-.5249372+02	-.2107042+04	.1443346+03	.0000000
.2456401-10	-.3296049+03	-.2639430+01	-.5986487+04	-.5154969+01	.0000000
.2924029-10	.0000000	-.1760892-03	-.7107150+04	.0000000	.0000000
.5884186-10	.0000000	-.1760892-03	-.7107150+04	.0000000	.0000000

THETA ANGLE= 3.14160 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
.2697032-10	-.6635914-04	-.1569485-08	.8265867-03	-.2159735-11	.0000000
.2401193-14	-.7715011+04	-.1393835-10	-.7714473+04	-.3926202-02	.0000000
-.2045372-10	-.7714473+04	-.8294794+02	-.4885279+04	-.3923713-02	.0000000
-.1025215-08	.5591518-02	-.1119322+02	-.2505265+05	.1401385-03	.0000000
-.2630742-09	.0000000	.8739018-03	-.2678838+05	.0000000	.0000000
-.9414317-15	.0000000	.8739018-03	-.2678838+05	.0000000	.0000000

THETA ANGLE= 3.92700 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
-.5722651-11	-.4199421-04	-.5773138-04	.1948932-03	.1479665-12	.0000000
.1203585-09	-.1910130+04	-.5126979-06	-.1910550+04	-.1444200+03	.0000000
-.5301842-10	-.1910550+04	-.5249297+02	-.2106970+04	-.1443284+03	.0000000
.2459352-10	.3296023+03	-.2639200+01	-.5985974+04	.5154750+01	.0000000
.2924830-10	.0000000	-.1761185-03	-.7106621+04	.0000000	.0000000
-.5884161-10	.0000000	-.1761185-03	-.7106621+04	.0000000	.0000000

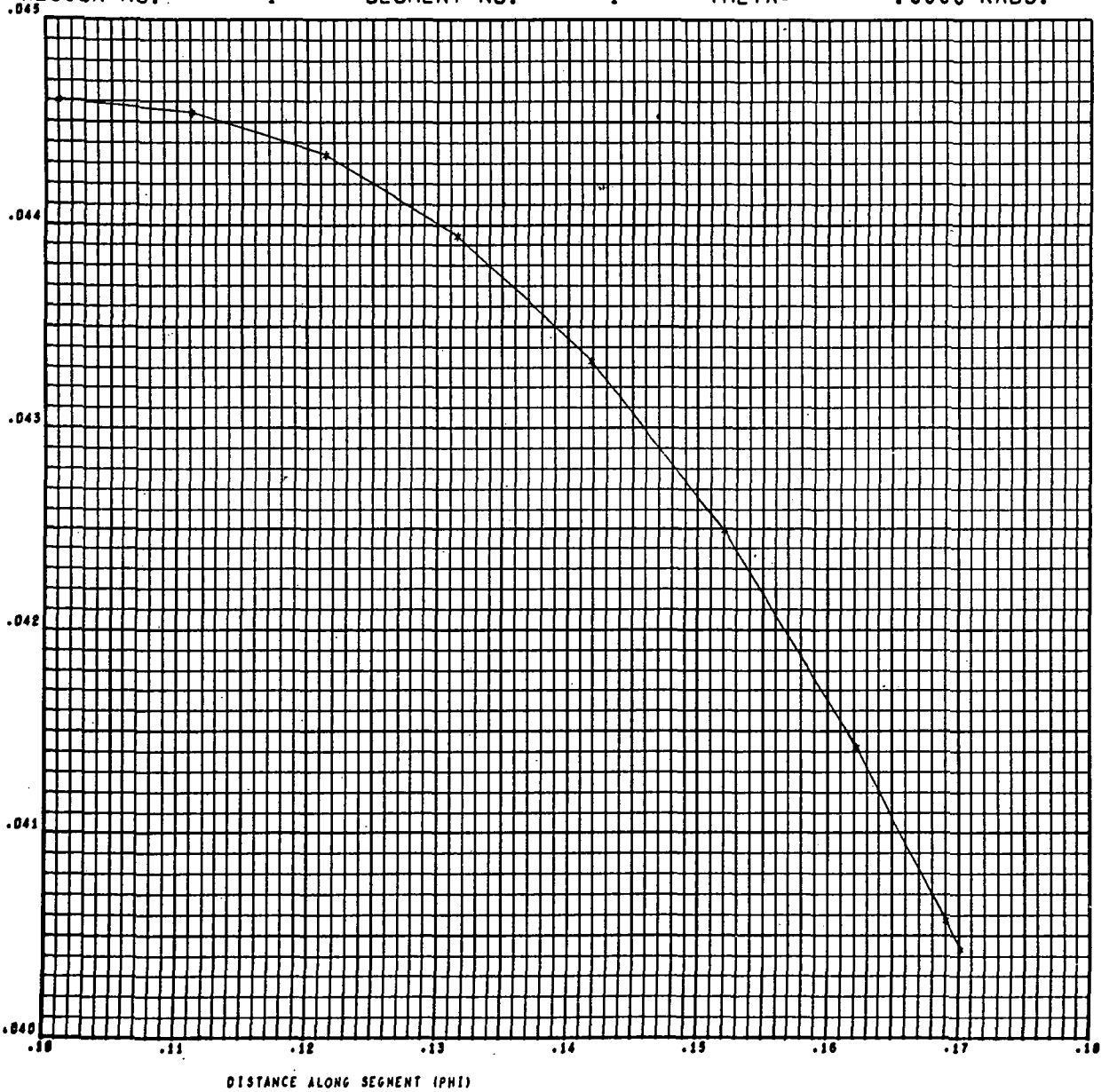
THETA ANGLE= 4.71240 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3543074+02	.3000000+00
-.2901062-10	-.4442895-04	.2361221-03	-.8312778-04	-.2053353-12	.0000000
-.2065787-09	.6676906+03	.2096990-05	.6665580+03	.5906797+03	.0000000
-.1722840-10	.6665580+03	-.5553724+02	-.1361166+04	.5903052+03	.0000000
.7653069-09	-.2428641+03	.1125608+01	.2366175+04	-.2108349+02	.0000000
.1870666-09	.0000000	-.8641587-03	.1160965+04	.0000000	.0000000
.2472921-10	.0000000	-.8641587-03	.1160965+04	.0000000	.0000000

THETA ANGLE= 5.49780 RADIANS

.6806784+00	.3900000+02	.1000000-01	.1701700-02	.3643074+02	.3000000+00
.2638505-10	-.1334911-03	.3916508-03	.1402343-02	-.8936987-11	.0000000
-.4124961-09	-.1292742+05	.3478222-05	-.1292700+05	.9797482+03	.0000000
.1803542-09	-.1292700+05	-.1668629+03	-.9046082+04	.9791271+03	.0000000
-.1030629-08	-.6730477+03	-.1898972+02	-.4256572+05	-.3497063+02	.0000000
-.4299491-09	.0000000	.1059661-02	-.4607503+05	.0000000	.0000000
.9381154-10	.0000000	.1059661-02	-.4607503+05	.0000000	.0000000

REGION NO.= 1 SEGMENT NO.= 1 THETA= .0000 RADS.



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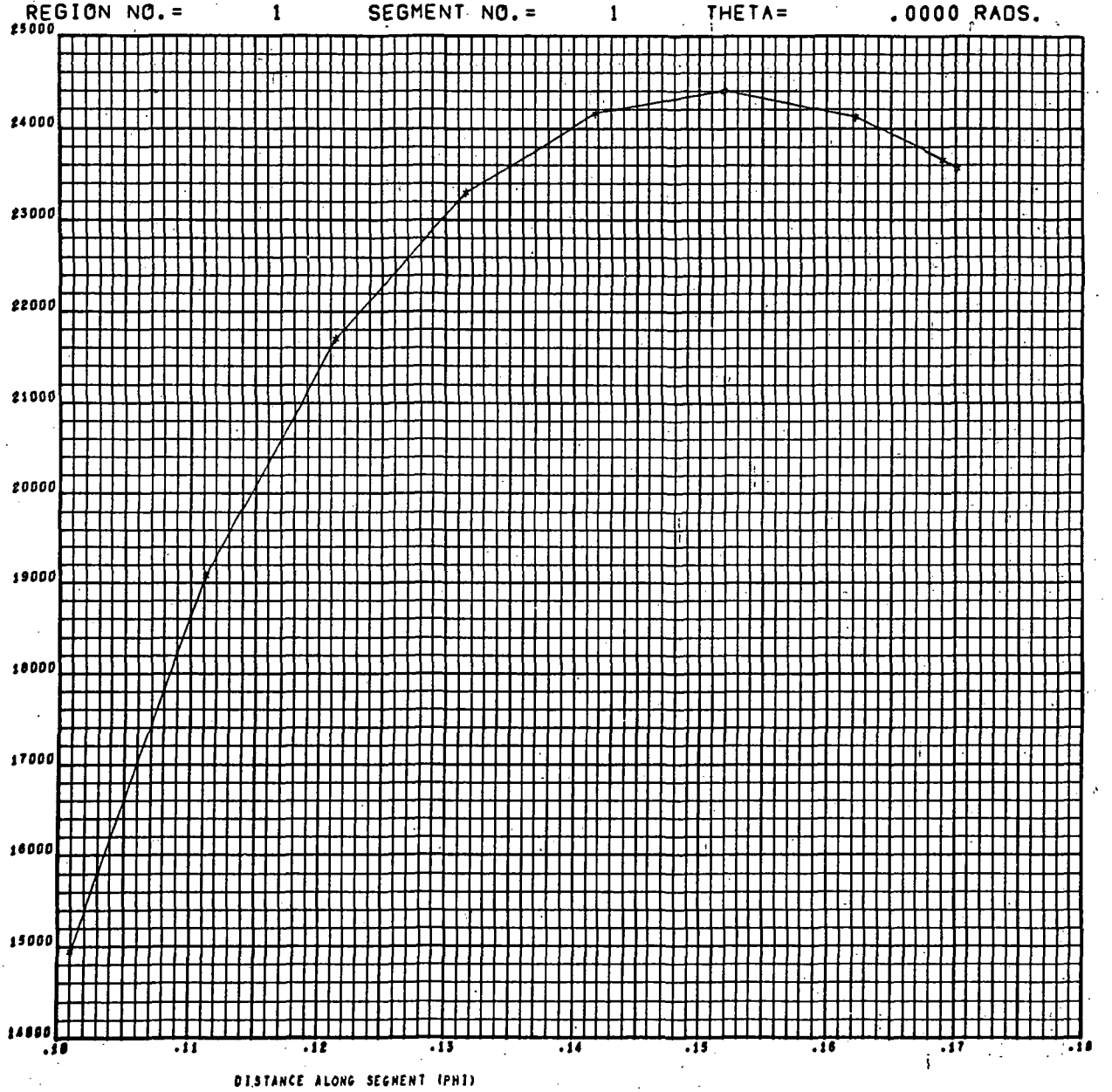

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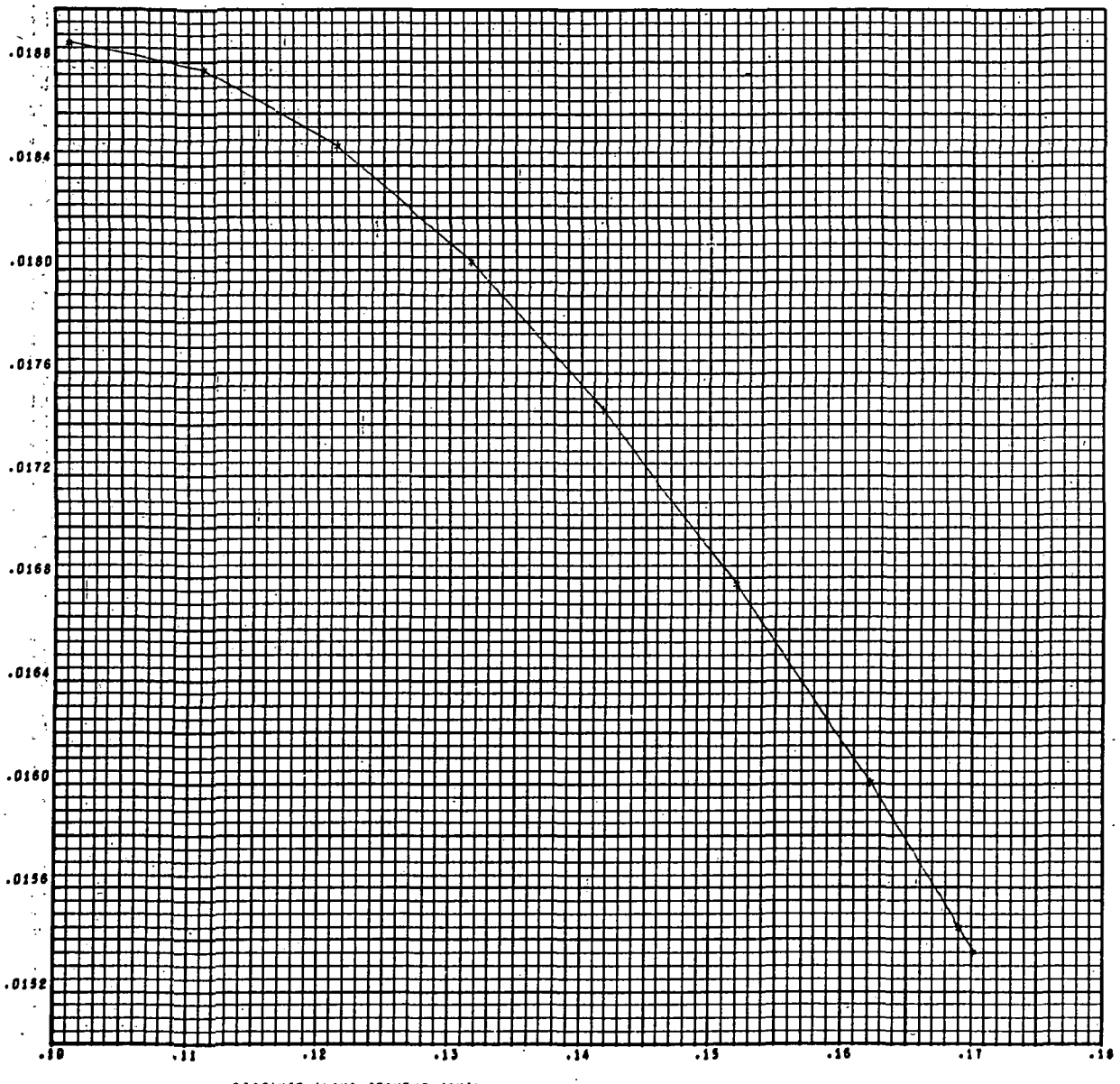

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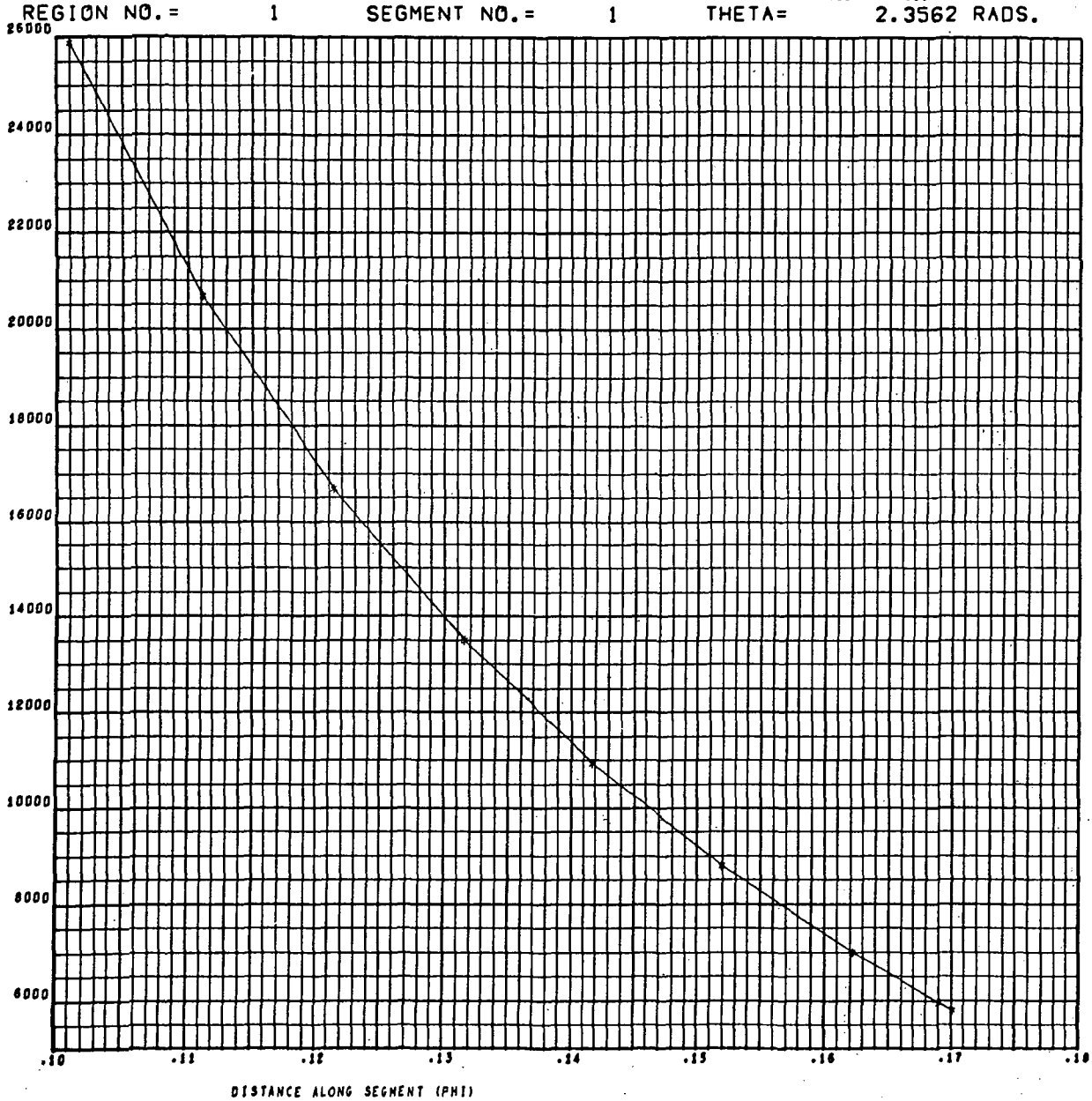

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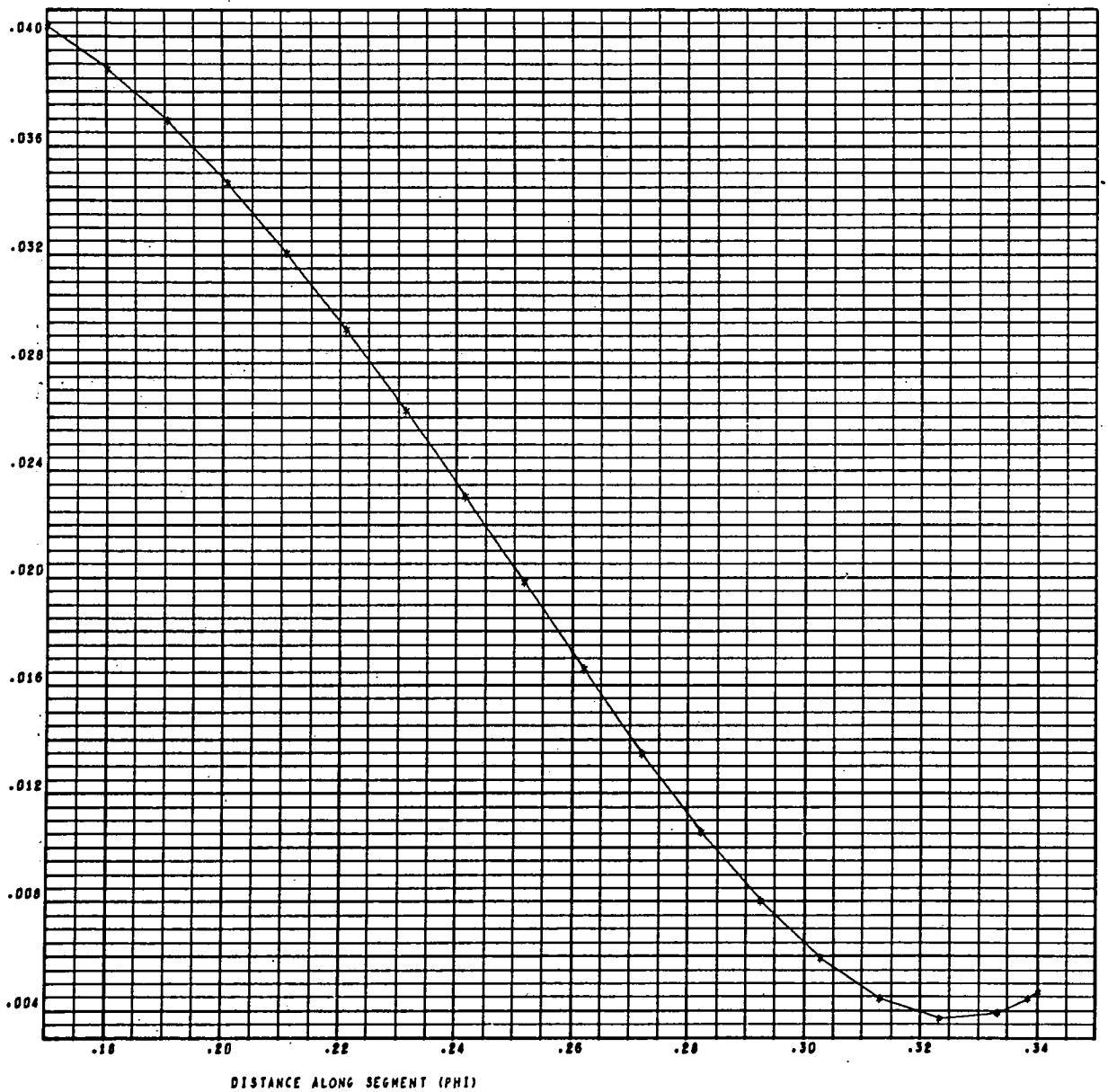

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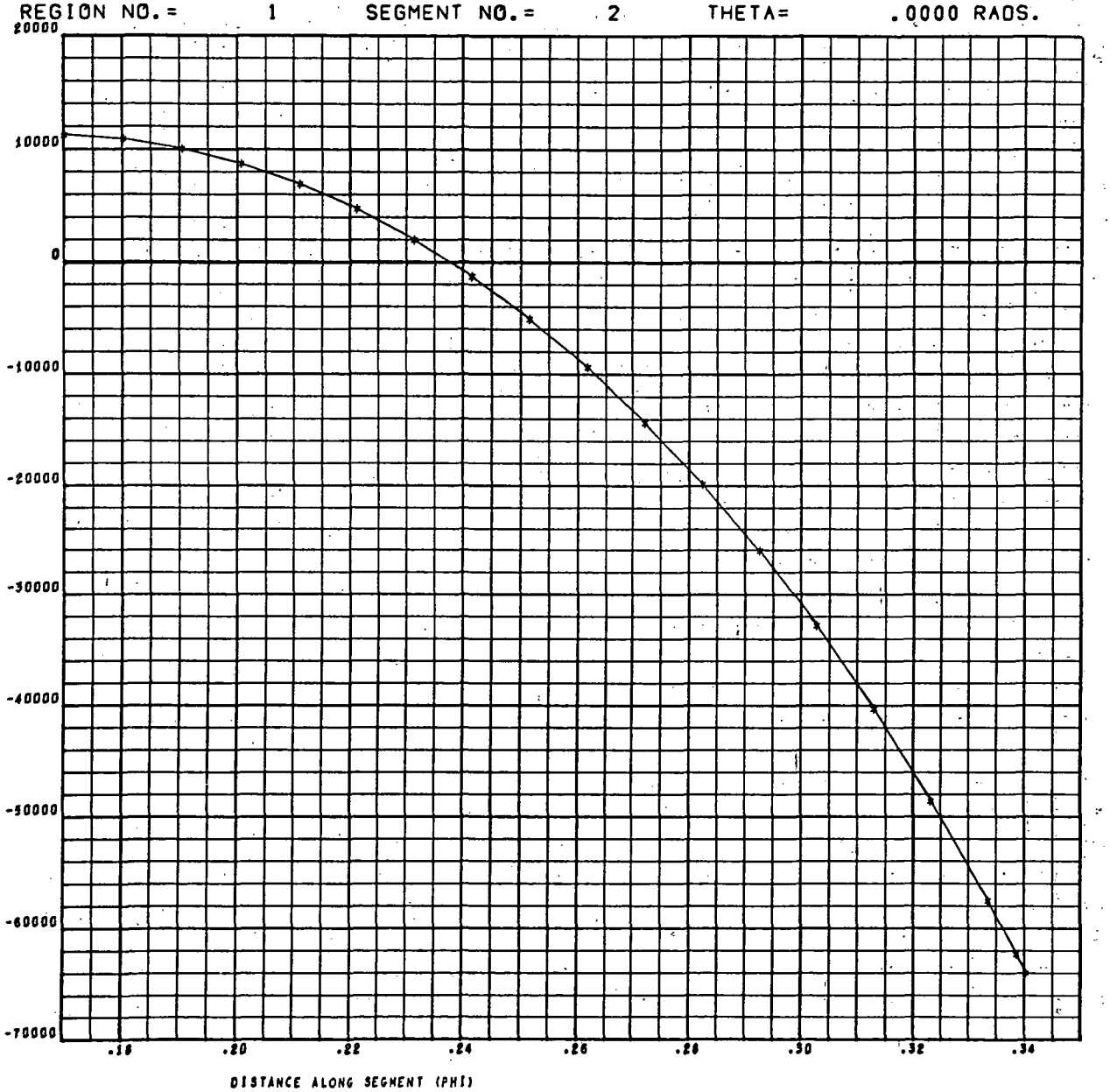

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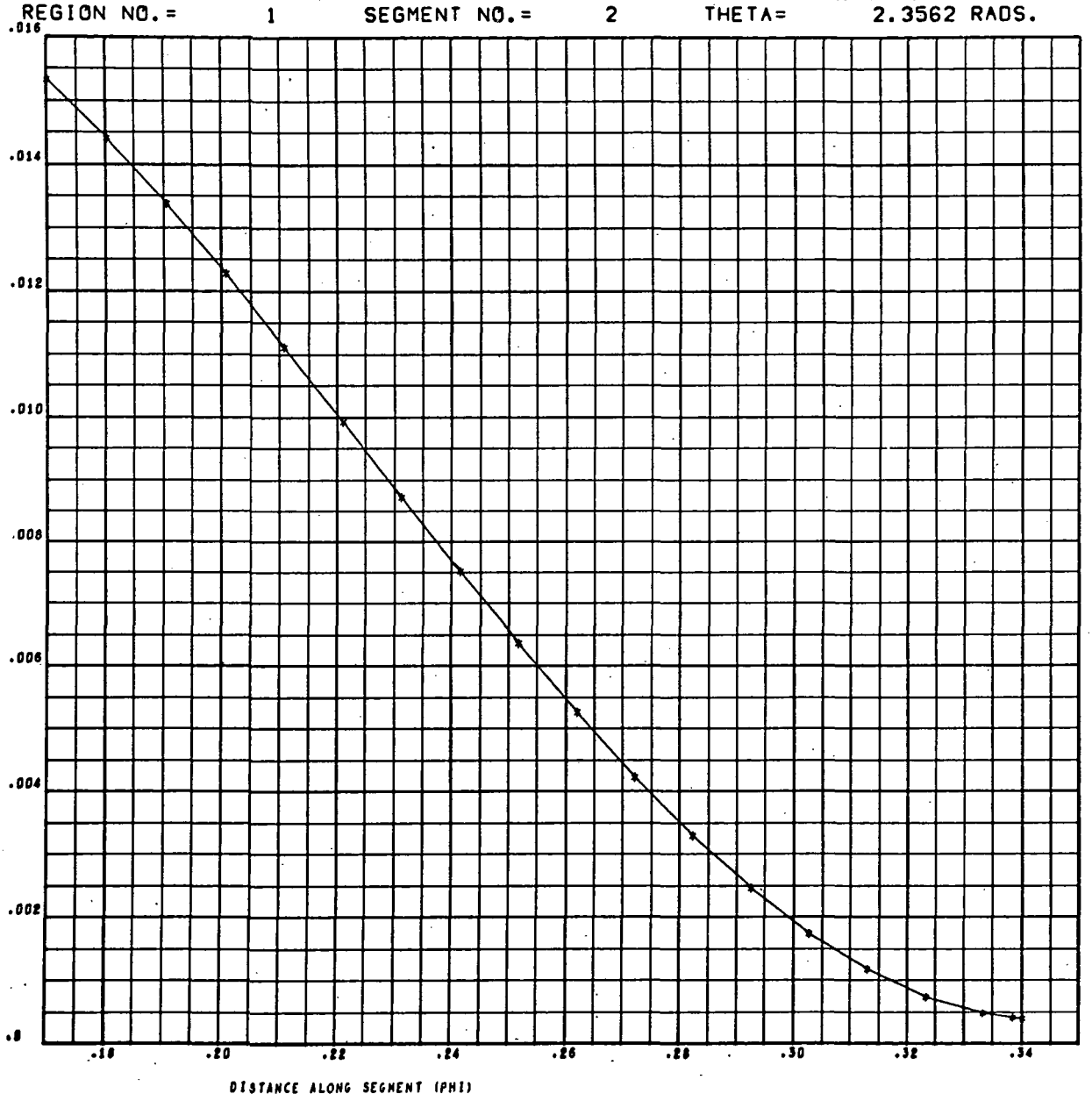

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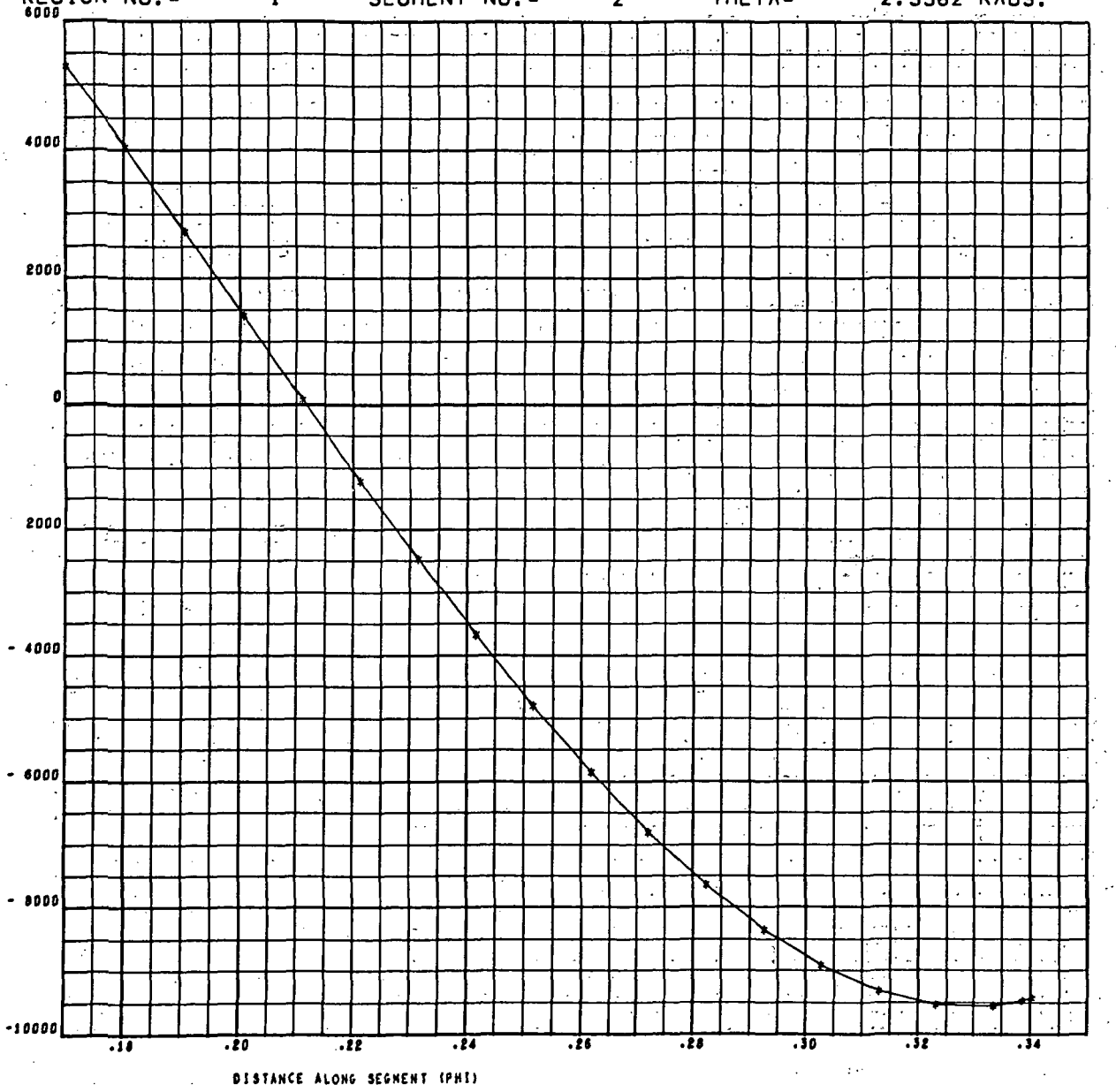

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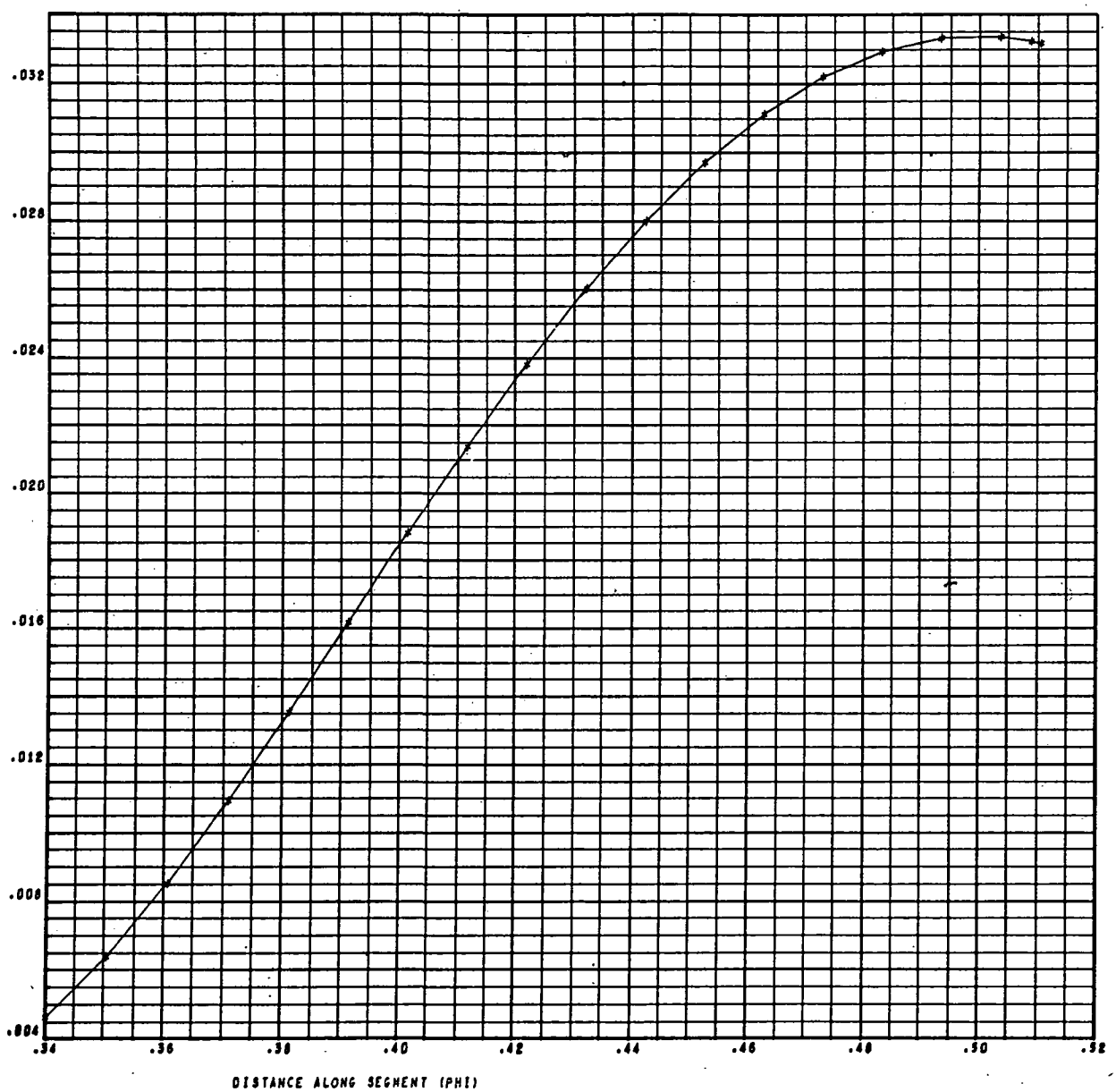

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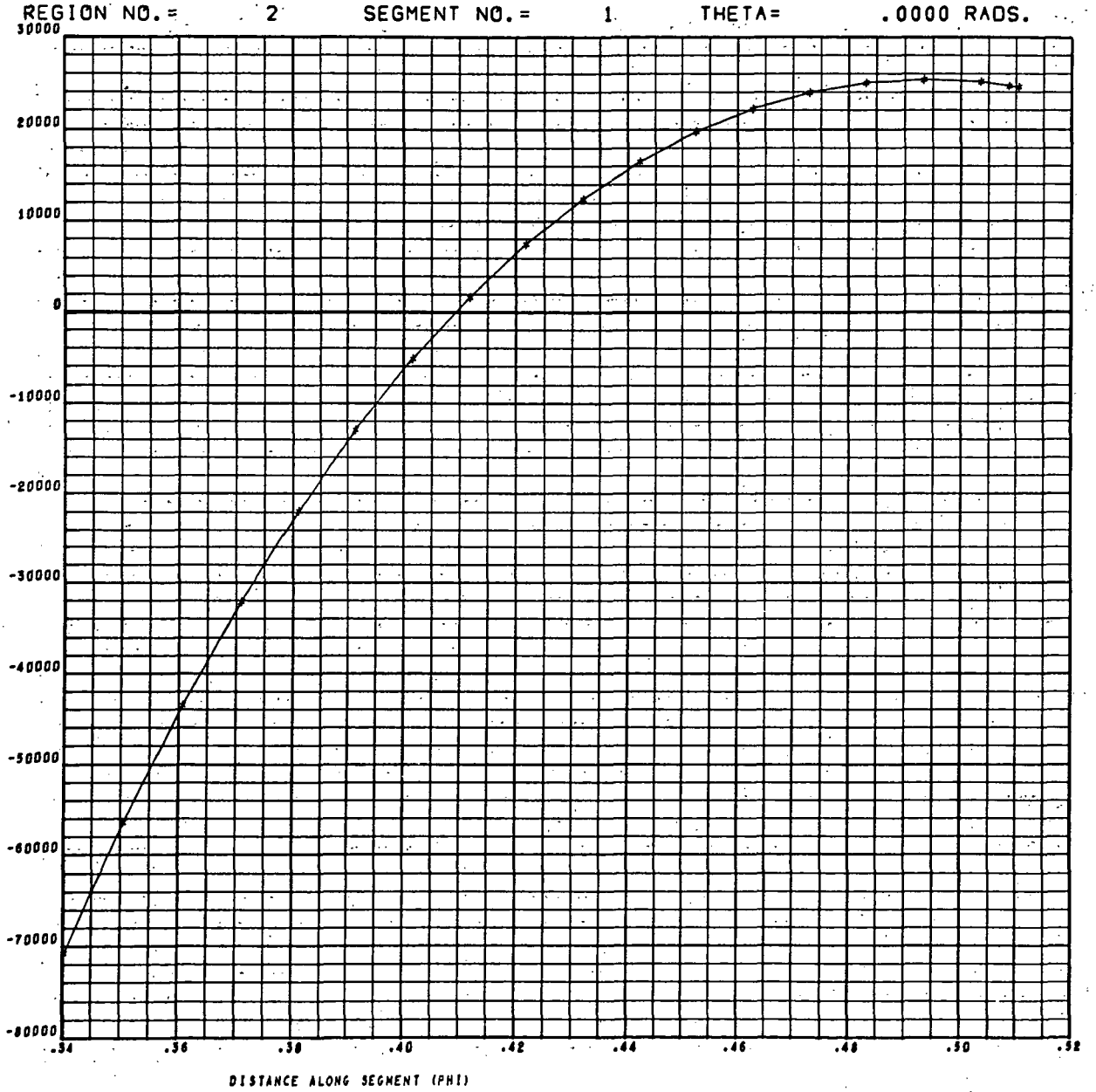

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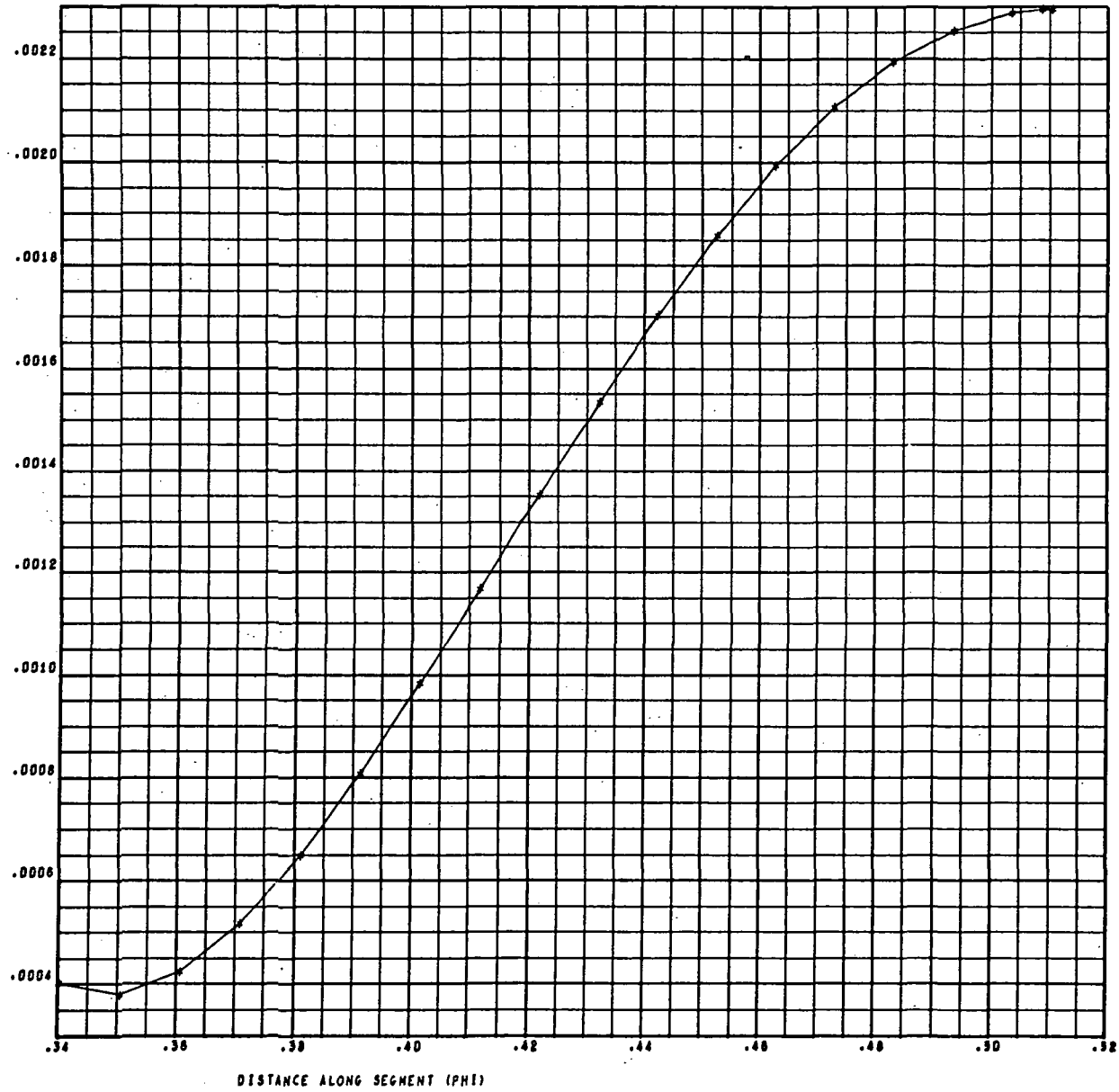

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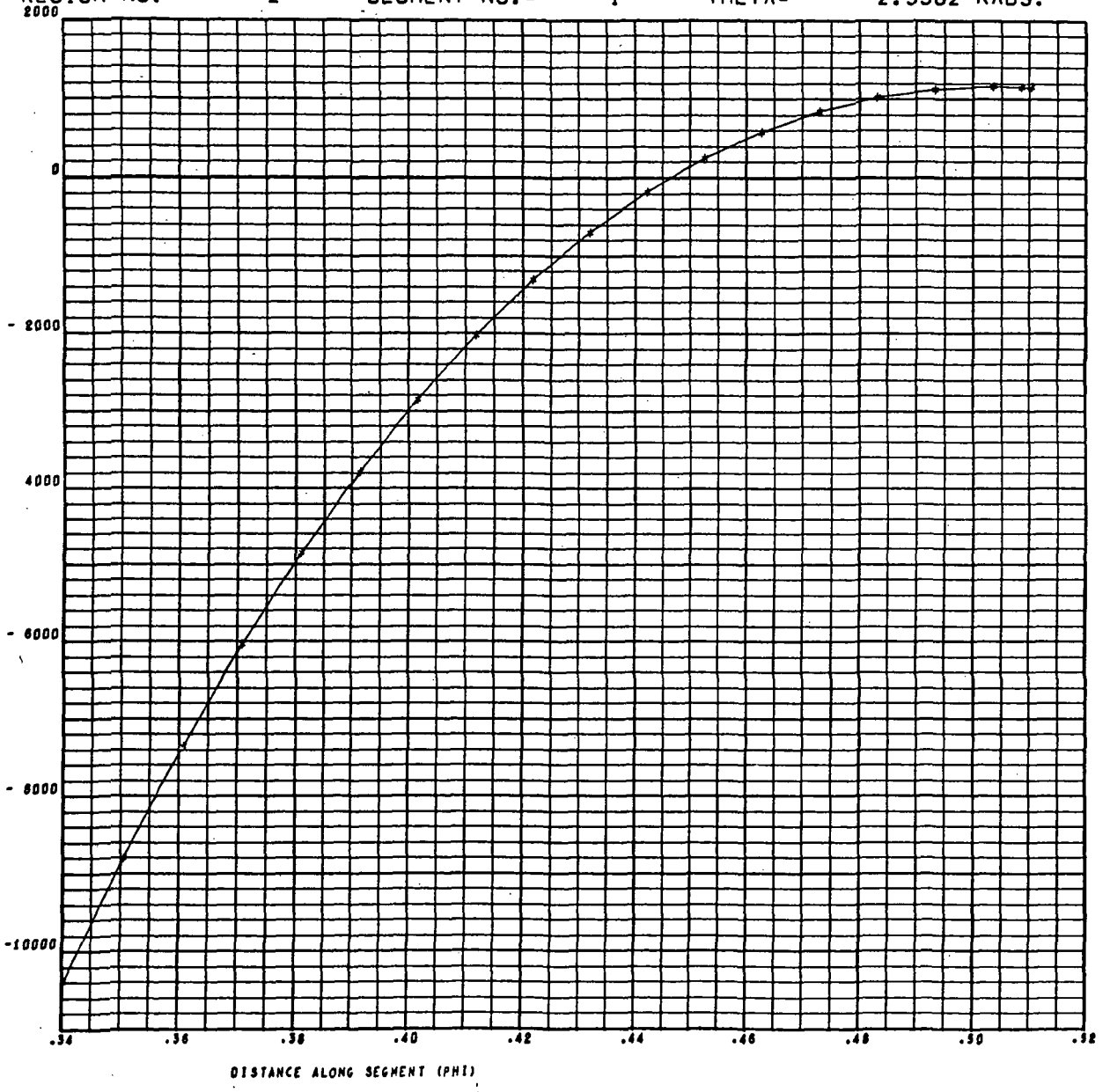

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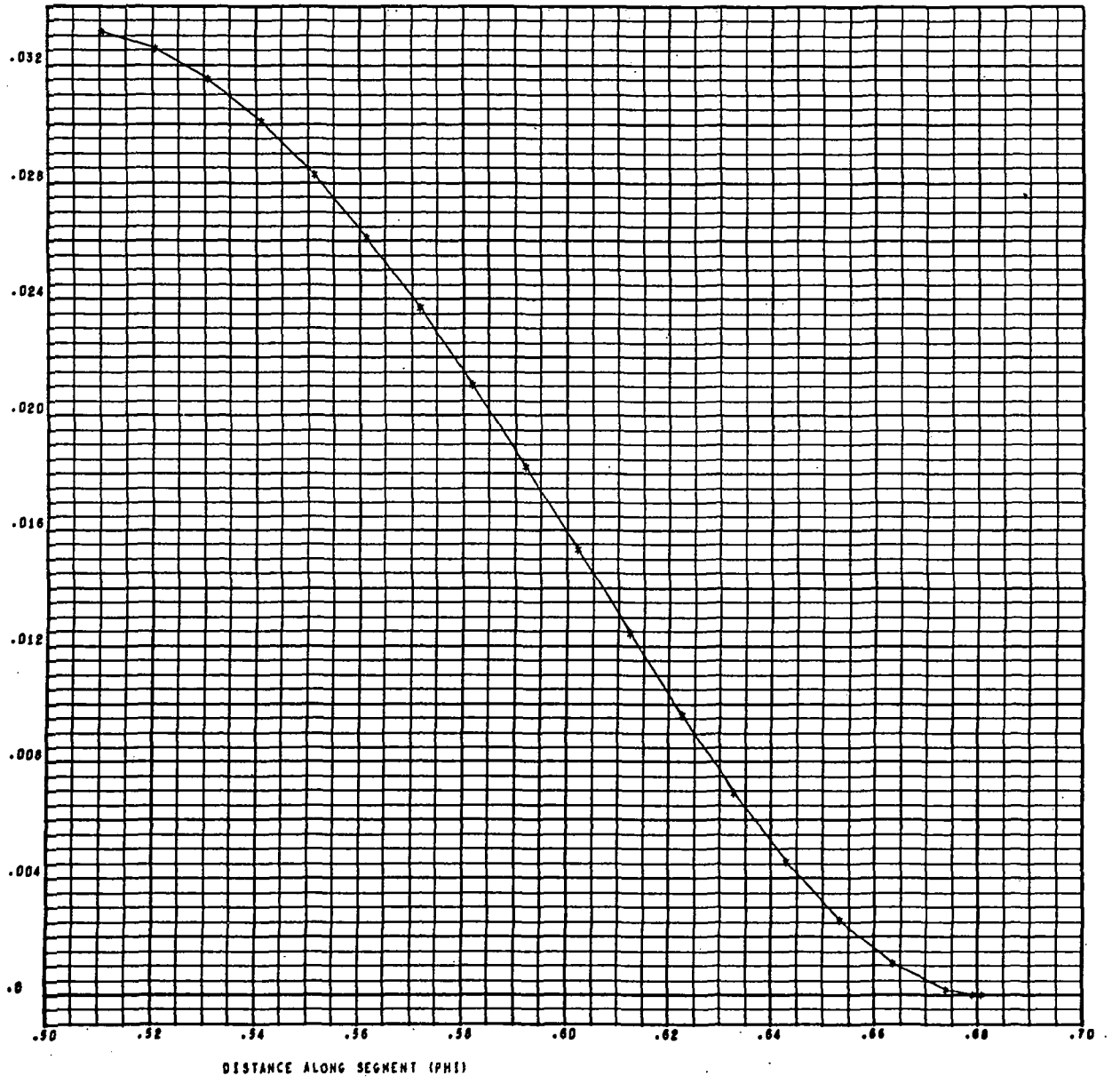

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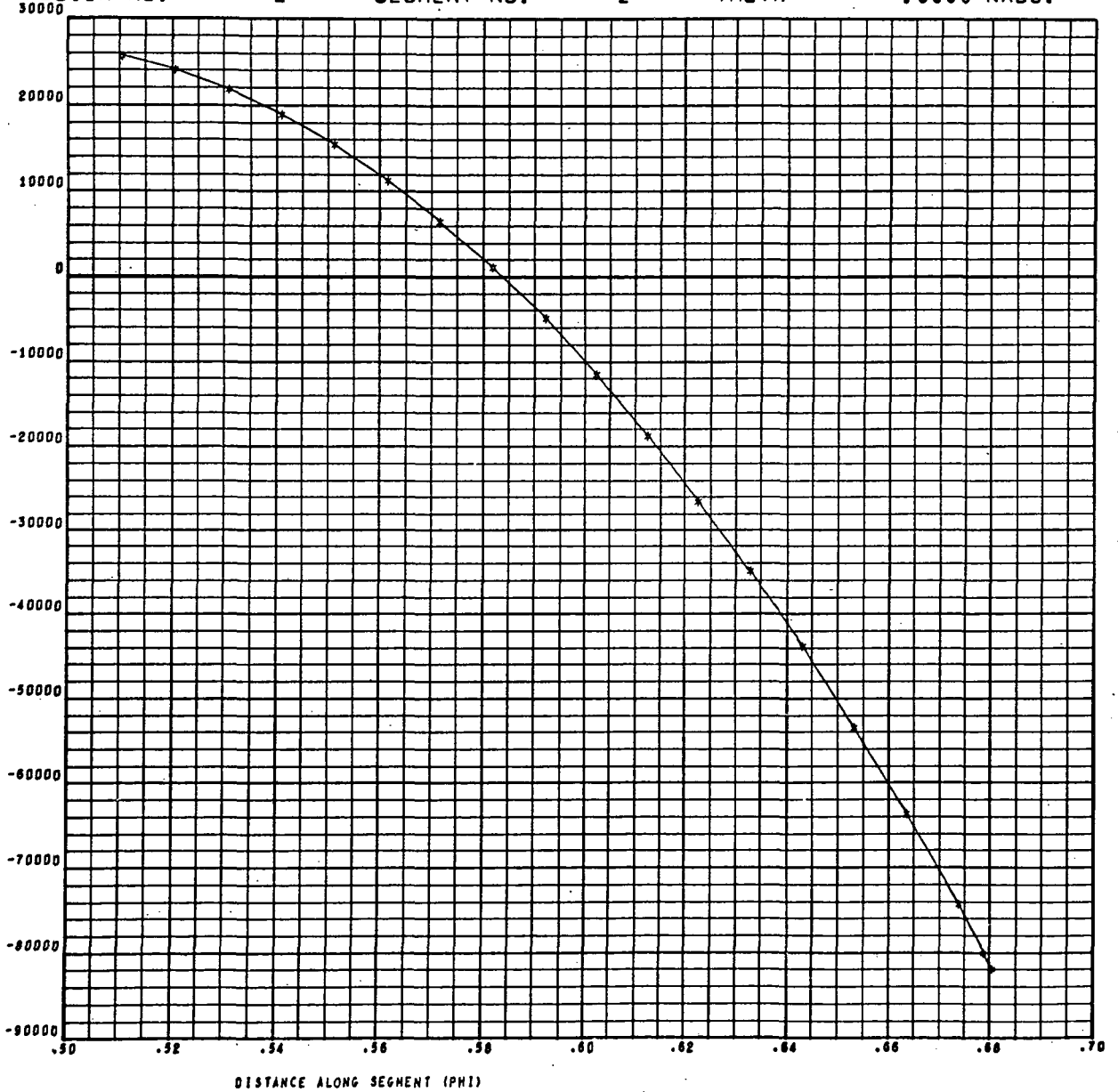

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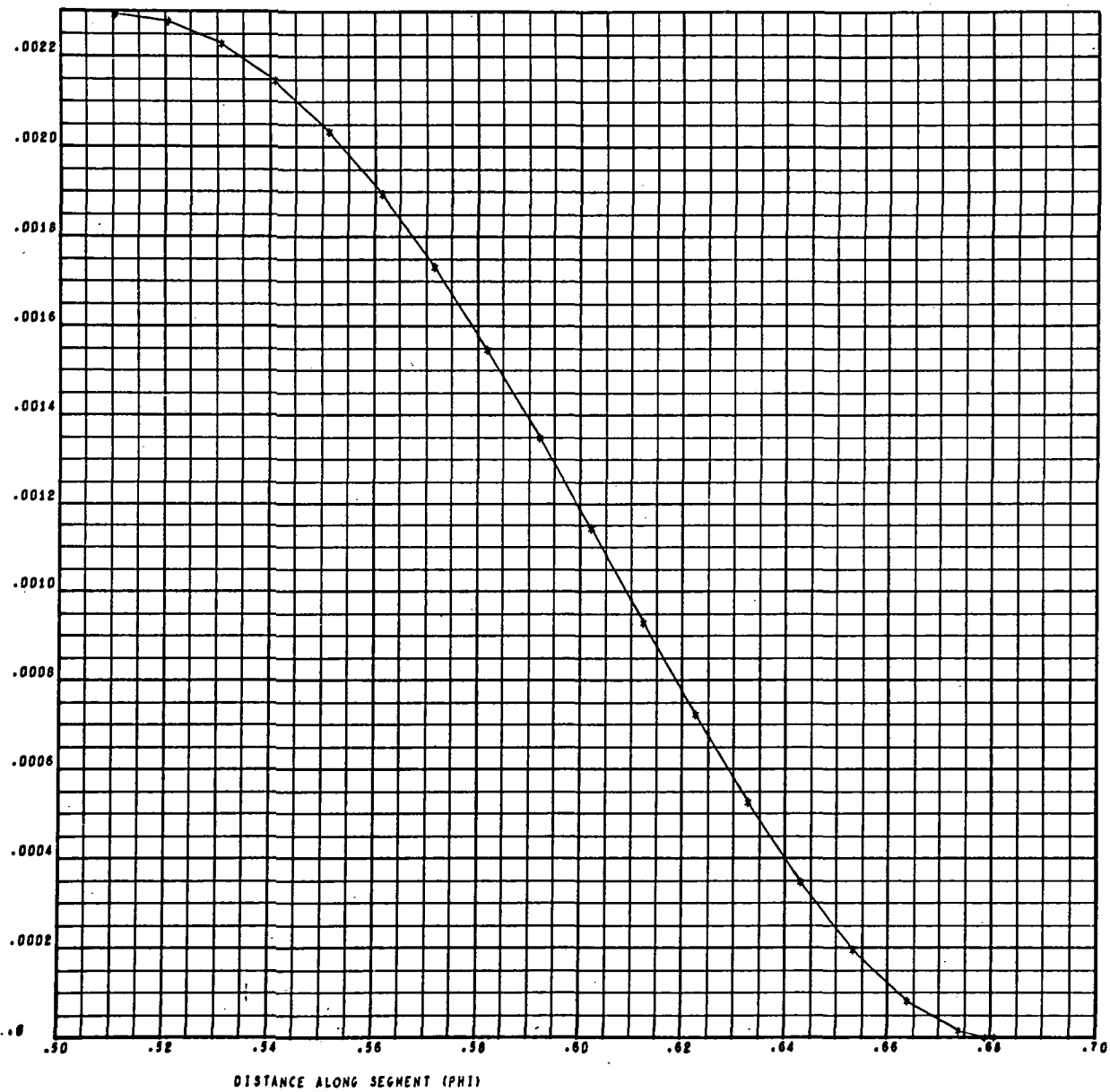

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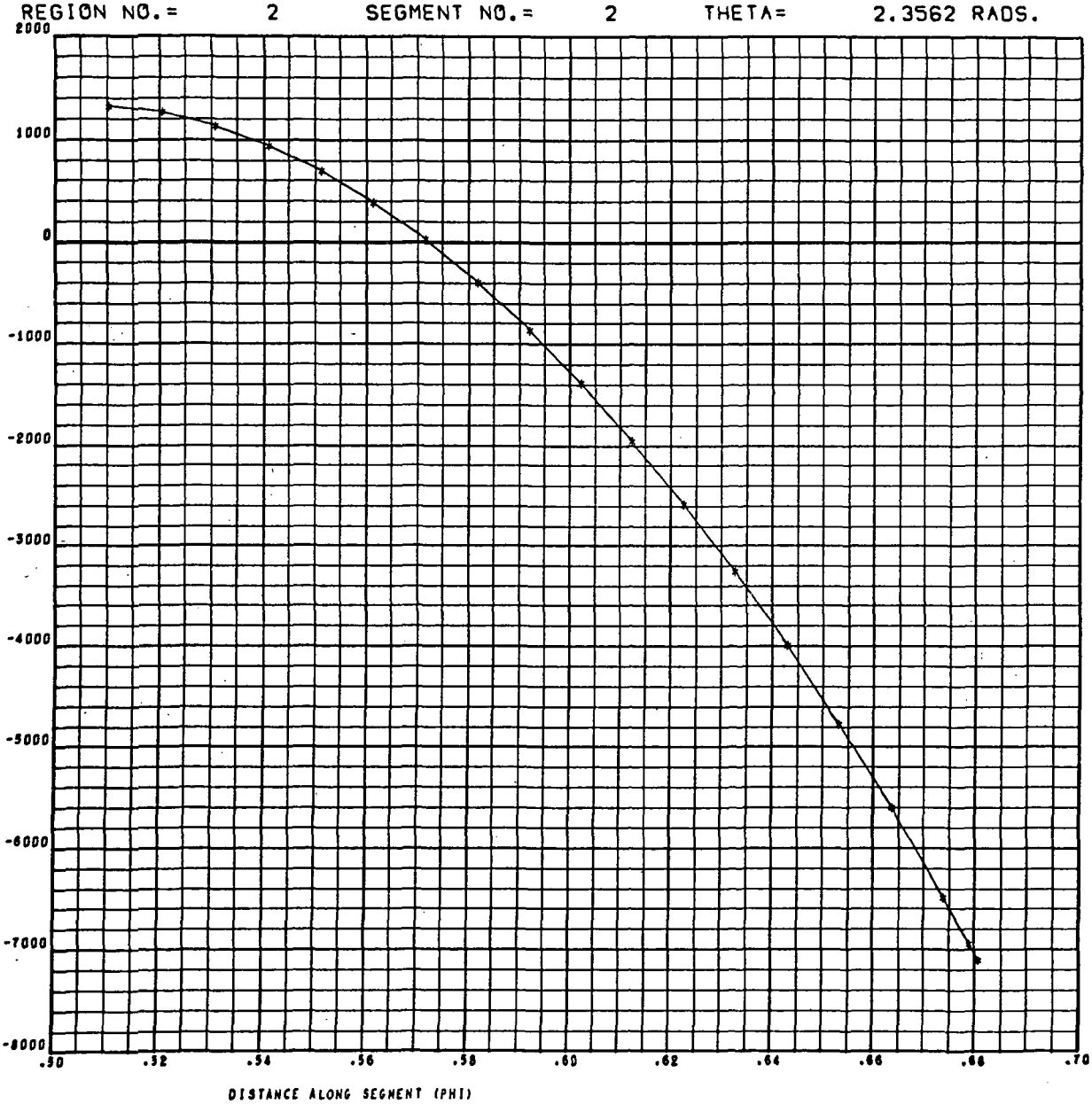

SECTION 5

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APPENDIX A

CONVERSION OF U.S. CUSTOMARY UNITS TO SI UNITS

The International System of Units (SI) was adopted by the Eleventh General Conference on Weights and Measures in 1960. Conversion factors for the units used in this report are given in the following table:

Physical quantity	U.S. Customary Unit	Conversion factor (*)	SI Unit (**)
Length	in.	0.0254	meters (m)
Stress modulus	ksi	6.895×10^6	newtons/meter^2 (N/m^2)
Stress resultant	lbf/in.	175.1	newtons/meter (N/m)
Temperature change	°F	5/9	Kelvin (K)

* Multiply value given in U.S. Customary Unit by conversion factor to obtain equivalent value in SI Units.

** Prefixes to indicate multiple of units are as follows:

Prefix	Multiple
giga (G)	10^9
mega (M)	10^6
kilo (k)	10^3
deci (d)	10^{-1}
centi (c)	10^{-2}
milli (m)	10^{-3}

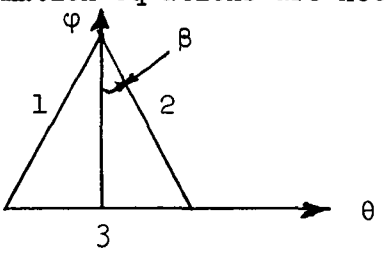
APPENDIX B

STRESS CALCULATIONS FOR REINFORCED CASES

Several items must be noted when a stress analysis is performed upon a reinforced construction by use of the present program. Some of these items can be treated as rules and some require engineering judgement. The rules to remember are as follows:

1. The hoop and meridional stresses output in a waffle reinforcement are actually in the waffle rib directions.

2. In order to obtain grid stresses for an isogrid construction the following tranformation equations are necessary:



$$\epsilon_1 = \frac{\epsilon_\theta + \epsilon_\varphi}{2} + \frac{\epsilon_\theta - \epsilon_\varphi}{2} \cos(\pi - 2\beta) + \frac{\gamma_{\varphi\theta}}{2} \sin(\pi - 2\beta)$$

$$\epsilon_2 = \frac{\epsilon_\theta + \epsilon_\varphi}{2} + \frac{\epsilon_\theta - \epsilon_\varphi}{2} \cos(\pi + 2\beta) + \frac{\gamma_{\varphi\theta}}{2} \sin(\pi + 2\beta)$$

$$\epsilon_3 = \epsilon_\theta \qquad (4\text{-}1)$$

Thus from the STARS-2S strain output the appropriate grid strains may be obtained, and thence, by using Hooke's Law, the stresses. Note that the strains used in Equation (4-1) should be at the desired crossection location thus:

$$\epsilon_i = \epsilon_o + \zeta_i k \qquad (4\text{-}2)$$

3. For a reinforced section, the in-plane shear stress is calculated only at a shell location (if requested) such as point 2 in Figure B-1, rather than points 1 or 4.

4. For an ST10 or RWAF option the crossection is described by the user in terms of overall stiffness properties. Thus no stresses can be calculated by the program for these cases.

Items requiring engineering consideration in the stress analysis, are the following:

1. If a shell crossection contains materials of different properties, either actually or due to differential thermal loading, there is no guarantee that the stress at the extreme point is the most critical. The analyst should decide whether a check of stresses at each location where material properties change is necessary.

2. For a structure such as that shown in Figure B-1, the program will calculate direct stresses at points 1, 4, 3 and the bottom point below 3, and in-plane shear stresses at points 3 and the point below 3. (Of course this can be modified by inputing different offset distances and stress clues.) While strain is assumed linear from point 1 to point 4, there is a stress discontinuity at point 2. This will occur even if the material properties of shell and ribs are the same, since the governing Hooke's Laws differ (see Reference 7). The analyst must again decide whether the stresses at point 2 could be more critical than those at the extreme points.

Any additional stress calculations that the analyst decides to make on the basis of items 1 and 2 above, should be always made using the program strain and curvature output, and Hooke's Laws for ring, stringer or shell (Ref. 7). This can be done automatically in the program by providing the correct ζ distance (instead of the extreme) and by setting the stress clues for the appropriate Hooke's Laws (segment card data sets 10 and 11).

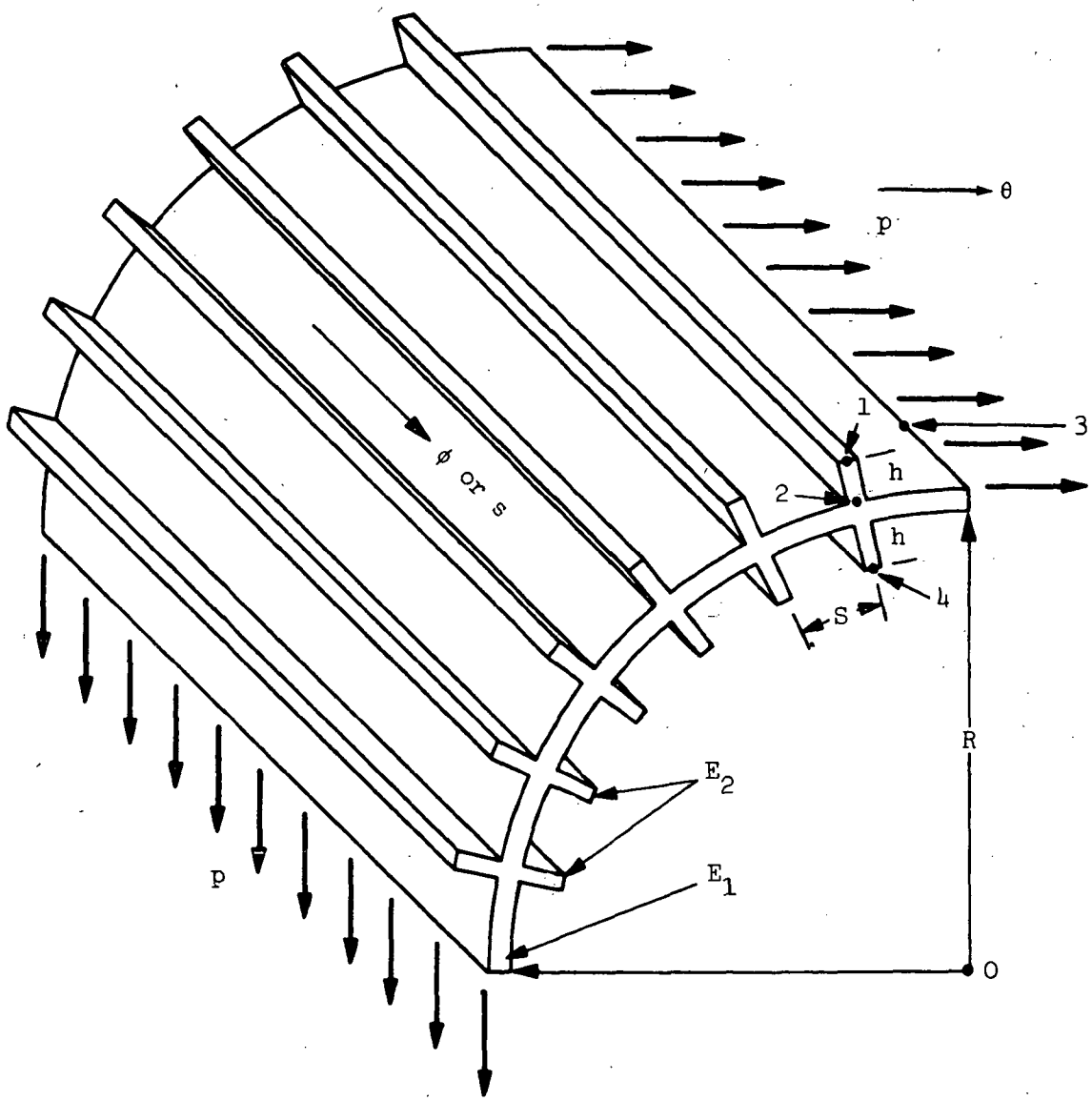


Figure B-1 Special Stress Case

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